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THE AUTOMOBILE

Fashion Hints on Winter Wear

Part I—In Which Are Reviewed the Modish and Warmth-Giving Garments for Men

Part II, to Appear in an Early Issue, Will Depict Ladies' Automobile Apparel

¶ *One of the most comfortable garments provided to meet the needs of men who like to hear the rhythmical hum of a good car over a frozen road and to feel the crisp, cold air sting their cheeks as they spin along. This is an imported double-breasted coat which was manufactured in London. It is warmly lined with sheep's wool and has three large chamois-lined pockets. The bottom is re-inforced with strongly stitched leather and the eight buttons enable the wearer to button it closely about him. A. J. Picard & Co., $42.50. The wool cap shown is of the Rodel type and sells for $2. It is made of soft, warm wool and is very flexible.*

NOW that the autumn season is over and the tang of winter is in the crisp sunlit air of the afternoon and the chill of the Arctic regions lurks in the twilight shadows, we find our fall automobile clothes beginning to show a surprising lack of warmth and comfort. So we who are fond of the Big Outdoors and the motor's cold weather hum let our thoughts drift toward supplying our wardrobes with an adequate and suitable line of winter garments for use in the car.

Of course, most men hold style in comparative scorn, holding comfort, durability and other common-sense features in infinitely higher esteem, but, just the same, when a man invests his more or less hard-earned money in an outfit for winter automobiling he wants it to show taste and at least a few becoming qualities. With this idea in mind, experienced representatives of THE AUTOMOBILE have gone over the stocks of a number of the most up-to-date automobile clothing supply houses in New York City and have selected the most comfortable, stylish and sensible garments for illustration and description. The men's coats, caps, mufflers, boots, gloves, etc., are taken up in this issue and the attractive apparel designed for the ladies who delight in winter motoring will be presented in an early issue.

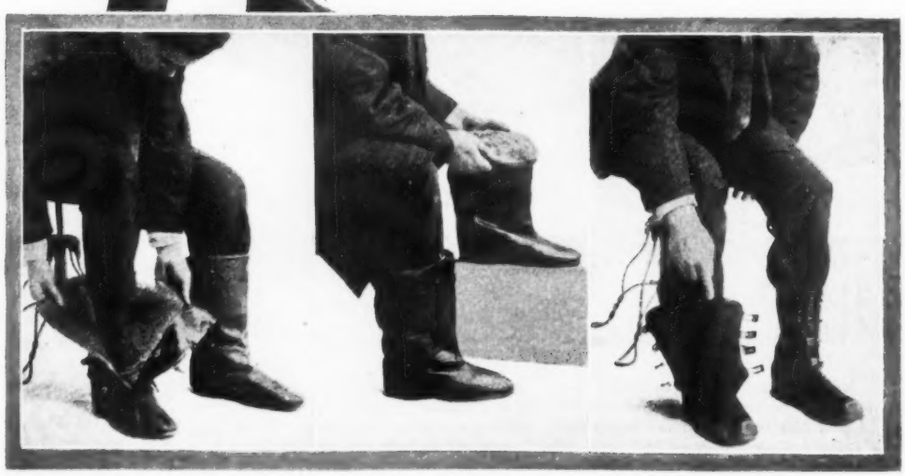
A glance over the styles offered for gentlemen's wear suffices to reveal the same underlying ideas of design which were apparent in the spring modes for the motorist. That is, the designers realize that clothes for the automobilist must be cut differently from the ordinary garments of similar type and that they must be at once conventional and stylish in appearance and also comfortable and adapted to special needs. But see them for yourself.

At the left is a gentleman's broadcloth coat with Persian lamb collar which may be buttoned close around the face if desired. The coat illustrated has muskrat lining but this style also comes in marmot, coney and Jap mink. With Skinner satin yoke lining this coat sells for $45 to $275. The same garment is shown below. The cap in that view is electric seal and sells for $5 to $18. Auto Supply Co.

Above is depicted an Angora wool vest which is warm and comfortable for wear in the car and at the same time offers some striking combinations in colors and patterns. The hues offered are of all shades. Auto Supply Co., $6.50 to $9.50

Combination reversible cap made of army cloth and provided with mackintosh hood which may be used either as an ordinary cap or as illustrated above. The hood folds inside. Auto Supply Co., $3.50.

Mackintosh automobile shirt for gentleman's wear with band collar and cuffs. A vest patch pocket is provided and vent holes at the sleeves. The shirt is offered in either black or tan. Auto Supply Co., $20 to $25.



Above at the left—Gentleman's leather boot lined with the softest fleece to insure warmth. Smith-Haines, $12.

In the center — Fleece-lined leather boots. They do not open like the type shown at the left. Smith-Haines, $9.

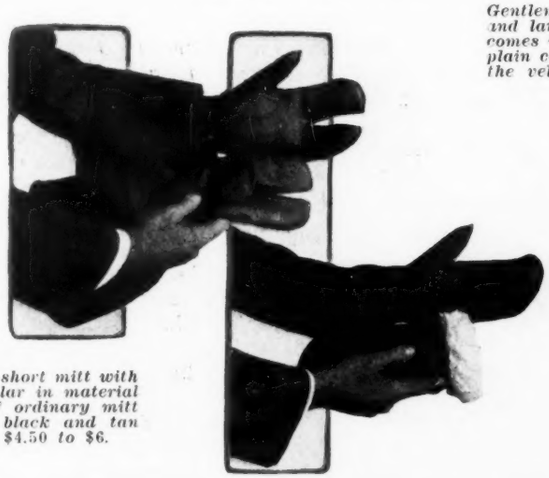
At the right—Men's four-buckle arctics made with cloth uppers and fleece linings. Lowe Motor Supplies Co., $4 to $6.

Below is depicted the single-breasted Jumbo sweater cut in Norfolk style with the usual belt and two lower pockets. The roll collar may be turned up to keep the face and neck warm. Smith-Haines, $8. The wool gloves shown are $2.25 and the Rodel cap sells at the same price.

Scotch plaid wool mackinaw in double-breasted form, with belt and three buttons. The mackinaw comes in all color combinations and plain shades and in 36 to 44-inch sizes. Wrist bands are attached. Lowe Motor Supplies Co., $10 to $12. Wool gloves, in gray, navy and black, at $0.50 to $1. Rodel cap, $1 and $2.

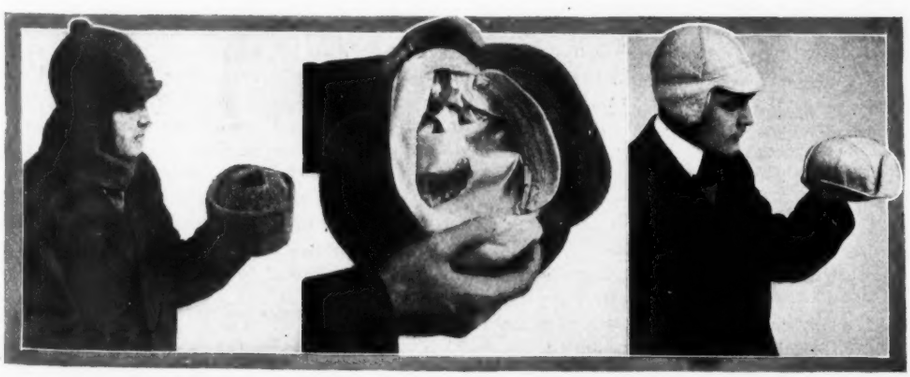
Gentleman's automobile coat with set-in sleeves and large patch pockets. This modish garment comes in all combinations of tartan checks and plain colors and a touch of elegance is given by the velvet piping on the sleeves. Auto Supply Co., $32.50 to $47.50.

To the upper right is shown the "Lobster" gauntlet, which gives the warmth of a mitt with the freedom of movement of a glove. It is lined with fleece and sheep's wool and comes in either black or tan leather. Auto Supply Co., $5 to $6.50.



At lower right is illustrated a short mitt with sheep's wool lining very similar in material to the "Lobster" type but of ordinary mitt shape. It is made in both black and tan leather. Auto Supply Co., $4.50 to $6.

Men's great ulster, made to withstand the most icy blasts of winter and to be suitable for all sorts of wear. The garment comes in frizes, chinchillas and worsteds. It is provided with two large patch pockets and is strongly made throughout. Auto Supply Co., $35 to $57.50.



Rodel cap in two forms, as worn it is pulled down for protecting cheeks, ears and neck. At right, folded for ordinary use. These caps are of finest wool and come in all colors. Many positions. Lowe Motor Supplies Co., $2.

Gentleman's driving cap with ear flaps. It is chamois lined and is provided with a chamois band for gripping the head, thus preventing the cap from blowing off. It comes in all sizes and colors. Auto Supply Co., $2.50.

Small racing cap of strongly stitched felt. It may be worn in several positions as illustrated. Note the tape binding at the edges to reinforce the material against wear. This cap comes in all sizes. Smith-Haines, $2.50.

Above is illustrated the Hylo sweater, which may be used either with or without the collar which folds out of sight. It is double-knitted wool and comes in Oxford gray, brown and blue with pearl buttons. A. J. Picard & Co., $8.

At the left are the Night-and-Day goggles, the upper third of the lenses being of amber glass so that lowering the head gives protection against glaring headlights. Leather mounting trimmed with chenille and gold-filled bows are used. A. J. Picard & Co., $3.75.

At the right is shown the Auto-Glas, which, while primarily a gentleman's glass, may also be used by the fairer motorists. It is sold with lenses of smoked, amber or plain glass with gold-filled bows and mountings. Auto Supply Co., $6.

Below is depicted an imported Angora coat sweater which is said to be unusually warm and comfortable for cold weather driving. It comes in all colors. Auto Supply Co., $5. The English cap shown comes in all colors and sells at $1 to $2.50.

Hupmobile Man Sees Fall of Antwerp

Manager of Hamburg Parts Depot in Dangerous Situation on Way to Visit Relatives—Breaks Through German Lines on Third Attempt

M. GASTON MARBAIX, manager of the Hupmobile Hamburg Parts Depot, has arrived in Detroit from Belgium, where he witnessed the fall of Antwerp.

"On the way to see relatives in Belgium," said Mr. Marbaix, "I had to take a round-about route. I first went to London, then to Ostend and from that place to Antwerp. When I reached London my German passports availed me nothing, and it was only through the assistance of Mr. Whiting, Hupmobile dealer there, that I was saved many difficulties.

Refugees in Flight

"At Antwerp I had my first view of the war. It was just before the fall of the city, and with the Germans only a few miles from the town, the inhabitants were in the utmost confusion. Refugees fleeing from destroyed or threatened districts, at first in scattered, straggling groups, and then in solid columns, passed through the town unendingly. Mainly they were afoot, though now and then a farmer's wagon would bulk above the weaving ranks, and it would be loaded with bedding and furniture and packed to overflowing with old women and babies. The majority of fleeing people were peasants, and as more than half of them wore wooden shoes the sound of their feet on the cobbled roadbed was like a battery of guns in action.

Aids Wounded with Car

"I at last located my brother, who was a volunteer in the medical corps in the army, and accompanied him on his rounds among the Belgian lines. We motored from the town to the most outward ring of forts, which was then bearing the brunt of the attack, and picked up whatever wounded we could find, bringing them back to the hospitals, which were already overflowing. The ghastly sights that I witnessed among the dead and wounded have since been the cause of many sleepless nights, for the horrors are unbelievable. Men maimed by shrapnel were literally torn to pieces, and I saw one poor fellow's arm shot away.

Through the Lines

"On the way to Mons I had to pass three times through the German lines. The first two attempts were unsuccessful, and each time I was sent back. At last, however, I hit upon an idea which carried me through.

"I had probably traveled about half the distance between Antwerp and Mons afoot when I stumbled upon a farmer with a load of potatoes who was going to my destination. He was well aware of the presence of the enemy in this vicinity, and he told me that the only way we could safely get through the lines was for me to get at the bottom of his wagon and be buried in the potatoes.

A Dangerous Moment

"The journey took 2 hours over cobblestone roads. We had traveled about 10 miles when I heard a sharp command to halt in a guttural German voice, and I could distinctly hear the conversation which ordered the driver off the wagon as the German soldiers wanted to buy the load of potatoes. I knew the Germans would shoot me on the spot as a spy, and there would be no investigation as to who I was, where I was from, or anything concerning me. I at last made out that the driver was trying to explain that the potatoes were for a German regiment which was some distance beyond, and after showing passports, etc., we were allowed to proceed.

Off for Home

"We finally reached Nimy, and I was very glad to get out and breathe fresh air again. I spent very little time at this place and made all haste to Ostend, where I embarked for London and thence to the United States."

Cars and Trucks on the Firing Line

Fleets of Trucks Needed for Convoys—Use American Machines—Motor Mail to Trenches—German Tire Plant Closed—Design of Armored Cars

By W. F. Bradley
Special Representative of THE AUTOMOBILE *with the Allied Armies in France*

PARIS, Oct. 28—In addition to the purchase of 2- and 3-ton trucks, for service in the French and Russian armies, the authorities are open to take delivery of touring car chassis to be fitted with light van bodies for quick transport work. The reason for turning to America for this class of vehicle is the inability of the French manufacturers to deliver fleets of cars. The French Government has requisitioned from private users all the automobiles it is likely to need for months ahead, and is keeping these machines in reserve at various military garages in Paris and elsewhere.

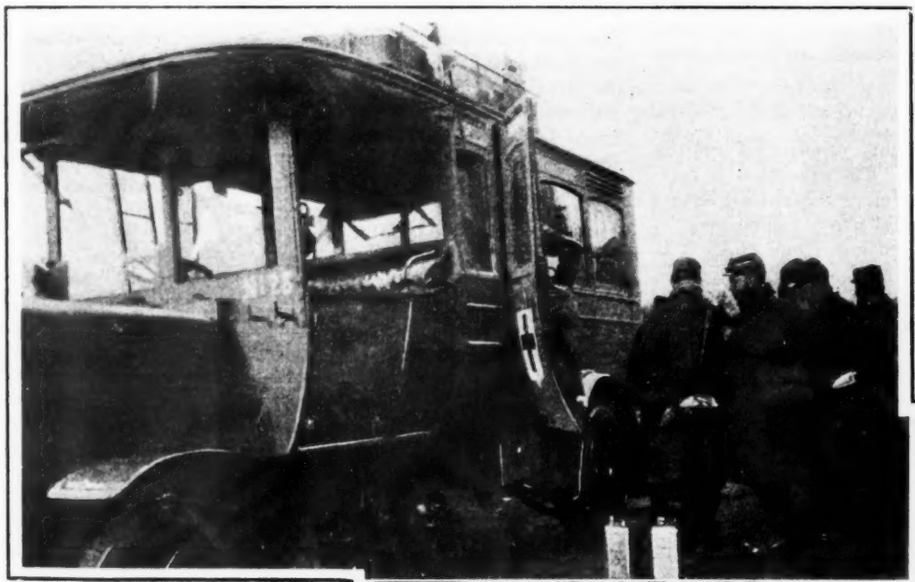
The cars taken from private service are a diversified set only suitable for individual service such as carrying officers. It is impossible to put machines of different make, widely different horsepower and weight, into convoy formation. Experience has shown that cars worked under these conditions are mutually destructive.

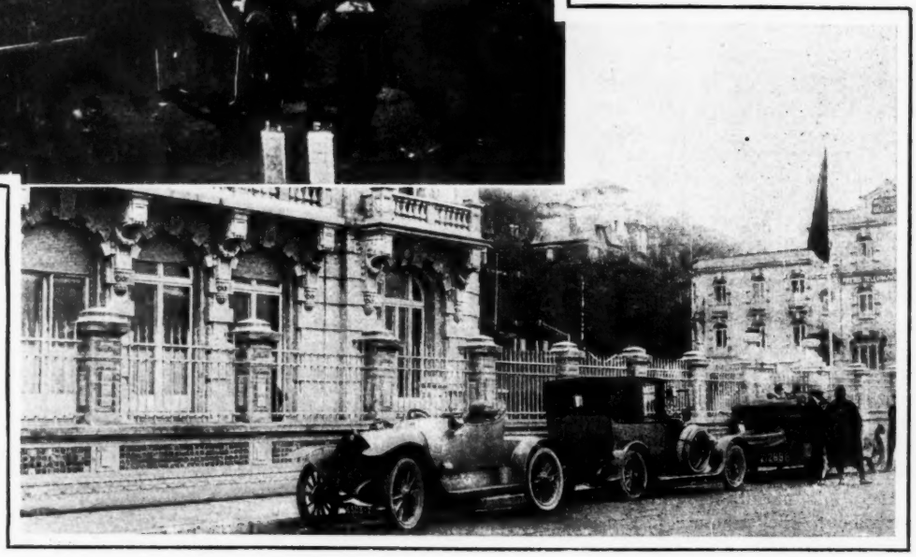
This makes it necessary to apply to manufacturers for fleets of not fewer than twenty uniform cars; but as the French passenger car manufacturers have not kept together sufficient staffs to fulfil such orders, it has been necessary to turn to America. Complete touring cars are not required. Chassis only are being bought, the horsepower being 15 *to* 20, *European rating.*

It is intended to fit these machines with very simple van bodies, but in all probability this work will be done in Europe. Detachable wheels, whether wood or metal, are looked upon with approval. Tires should be European millimeter size, for very few American size tires are made in Europe.

Spares Needed

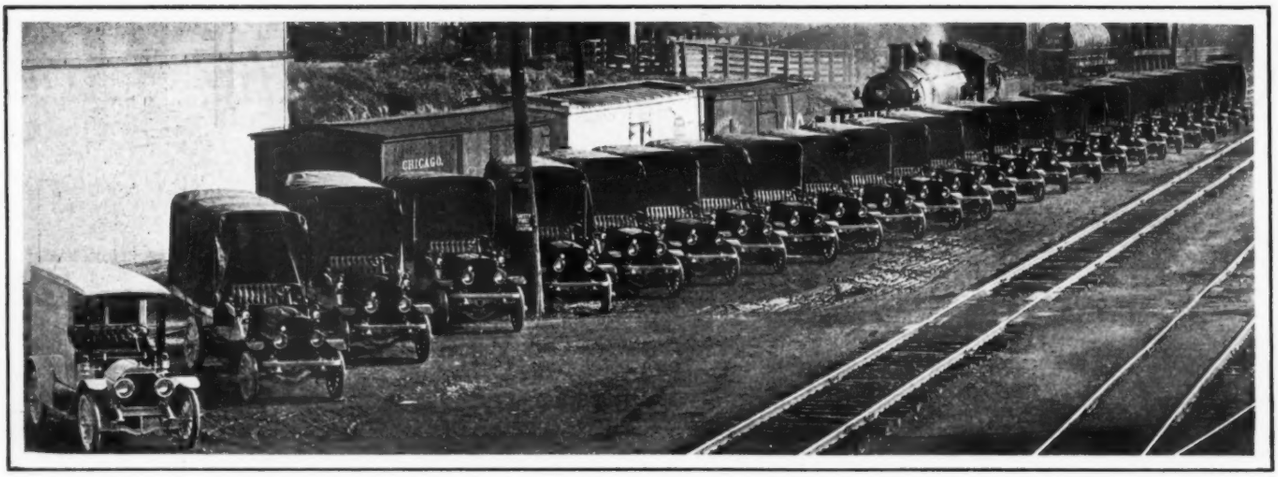
All necessary tools and spares must be supplied with the cars. The necessary spares for active service are as follows: set of spark plugs, set of bolts, nuts and washers, set of gaskets, carbureter float, carbureter jet, magneto parts, one set of brake shoes, one main and one connecting rod bearing, one of each type of ball bearing used on the car, one of each type of screw-down greaser, one valve complete with cup and pin, one set of piston rings, a set of steering gear levers, one fan belt, a clutch leather or set of disks in case of a metallic clutch, a piece of each type of





Above is shown one of the motor ambulances of the German Red Cross Society used in caring for the French wounded. These ambulances are frequently under fire

At the right is the Belgian Ministry of the Interior at Havre, France, where the Belgian Government is quartered



A fleet of Kisselkar trucks recently shipped to Europe for use by the armies of the warring nations

rubber tube for water circulation. With this list of parts the car is prepared for almost any emergency, yet the weight is not sufficient to seriously interfere with the speed or load capacity of the machine.

These parts are those which must be furnished with every truck supplied to the French army. Where a number of vehicles is taken over, as for instance in the case of the 1,100 Paris motorbuses, all of one type, the spare parts are reduced so that the complete set is spread over each group of ten or twelve cars, these ten or twelve working together as a convoy. This plan will be followed, doubtless, for the touring car purchases, so as to reduce the weight of the spares to be carried by the individual cars. At the same time there will be found everything necessary for replacements in each group.

Mail Motors at Trenches

Automobiles have solved the difficult problem of getting mail to the troops in the firing line. The operation is complicated. For military and administrative reasons all letters have first to be sent to the regimental depot, which may be hundreds of miles from the firing line and from which it is known the men were sent away 3 months ago. At the depot the letters are sorted and dispatched to the general headquarters, which is some distance back of the firing line. At this point the automobile service steps in. Most of the Paris postal vans—two-cylinder Delahayes—have been sent to the front and make journeys out from general headquarters to the different batallions. A cyclist accompanies each van, his machine being carried on the top of the automobile, and assists in the final distribution of the letters. Where the men are scattered over a small area it is possible for the cyclist to deliver more expeditiously than the automobile, the car meanwhile making a longer trip and picking up the bicycle on the return.

Parcel Post to Trenches

In addition to the official service, the Automobile Club of France has been carrying out a special parcel post service for the benefit of men at the front. The club has undertaken to deliver to the men parcels of clothing, tobacco and other comforts, prepared by relatives and friends. At first these were delivered direct to the men to whom they were addressed, but of late, owing to the scattered nature of the operations, it has only been possible to take out anonymous parcels, which are handed over to officers at the front and distributed by them to the men most in need of the goods. The club is maintaining a constant service of automobiles throughout the whole of the territory occupied by the French army.

German Tire Factory Closed by Order of France

PARIS, Oct. 28—By order of the French Government, the Continental Tire Co.'s Paris and suburban establishments have been closed and probably will not be allowed to open again under any conditions. The Continental Co. is a German firm with headquarters at Hanover. A French branch was founded as a "société anonyme," under the French laws, some 8 or 9 years ago, but all the stockholders, with one exception, were German. On the outbreak of war the offices and sales department in Paris were closed and practically all the directors of the company left immediately for Germany. The firm's important factory at Clichy, in the suburbs of Paris, was allowed to remain open, under the control of Maurice Echalié, the only French member of the firm. It is probable that the whole of the tires manufactured since August 1 were purchased by the French army. In addition, the whole of the stock of the company was requisitioned.

Factory Used for Spying

Recent revelations of German firms spying and assisting the military authorities of their country with a view to an invasion of France have so aroused the public that it has become necessary to order the closing of German establishments. It is in consequence of this order that the Continental company has been shut down. For at least 2 years there has been an attempt on the part of the leading French tire firm to prove that the Continental establishment was merely a subterfuge to cover an extensive system of spying, particularly with regard to military aviation and automobile matters. Until the outbreak of the war, however, the public refused to look upon this campaign as anything more important than an adroit publicity scheme.

Close American Depots

On account of the war it has been decided to close the Paris branch of the Hudson Motor Car Co. About a year ago it was decided to make a bid for Continental trade. F. O. Bezner, one of the vice-presidents of the company, took charge of the campaign, and had made plans for participation in all the automobile shows this fall. John Olt, general sales manager, sailed for America early in the war. As the fighting seems likely to be of long duration, Mr. Bezner has decided to wind up the French branch.

The Pierce-Arrow Motor Car Co. has withdrawn from the French market. The company has maintained a Paris depot for several years, but on the recent expiration of their contract they decided not to renew. They are now unrepre-

sented on the continent, although a spare parts depot has been established in London.

R. N. Goode, general manager of the Paris branch of the Packard Motor Car Co., is leaving Paris this week for the Detroit factory. It is understood that Mr. Goode has in his pocket a big order for Packard touring car chassis and trucks to be supplied to the French or Russian armies, or probably to both.

Close Terrot Co.

Declared to be backed by German capital, the Terrot Automobile Co., at Dijon, has been closed by order of the Government, an official receiver being put in charge. This firm produced bicycles, motorcycles, and recently placed on the market a popular type of light car. The shutting down of German firms is proceeding apace, but the number of automobile and kindred establishments affected in this way is very small.

News of Race Drivers

Robert F. L. Crossman, lieutenant in the British navy, is officially reported to have been captured during the fighting around Antwerp and sent as a prisoner into Germany. Crossman is a well-known English race driver who will be remembered by Americans as mechanician to Albert Guyot on the Sunbeam car in the 1913 Indianapolis 500-mile race. Before becoming interested in automobile racing Crossman held the rank of lieutenant in the British navy.

Albert Guyot, who drove in the last two Indianapolis races, has been treated in the military hospital for dysentery. As the attack was not very severe, Guyot was not sent back to the military base, but was treated in the field hospital somewhere on the eastern frontier.

Robert Laly, who rode with René Thomas on the winning Delage at Indianapolis this year, has not been heard of since the outbreak of the war. Laly, having but recently completed his military service, was one of the first to be called up and was sent direct to the eastern frontier, where the most bitter fighting took place.

After serving as an artilleryman in a fort at Belfort, Jules Goux has, on his own request, been transferred to the automobile section. Recent reports from the front indicate that the following automobilists on active service are still in good health: Georges Boillot, Charles Faroux, Victor Rigal, Jean Chassagne, Louis Wagner, G. Caillois, Arthur Duray, Rougier, Champoiseau, who for a time was detailed for army Red Cross service with Mr. Bacon, former U. S. Ambassador; Gabriel, and René de Knyff, president of the Sporting Committee of the A. C. F.

Henry Mathyss, mechanician for Arthur Duray on the little Peugeot which finished second at Indianapolis last May, has volunteered for automobile service with the French army and has been accepted. Both Duray and his mechanician are of Belgian nationality and in consequence not under military obligations.

New Paris Buses

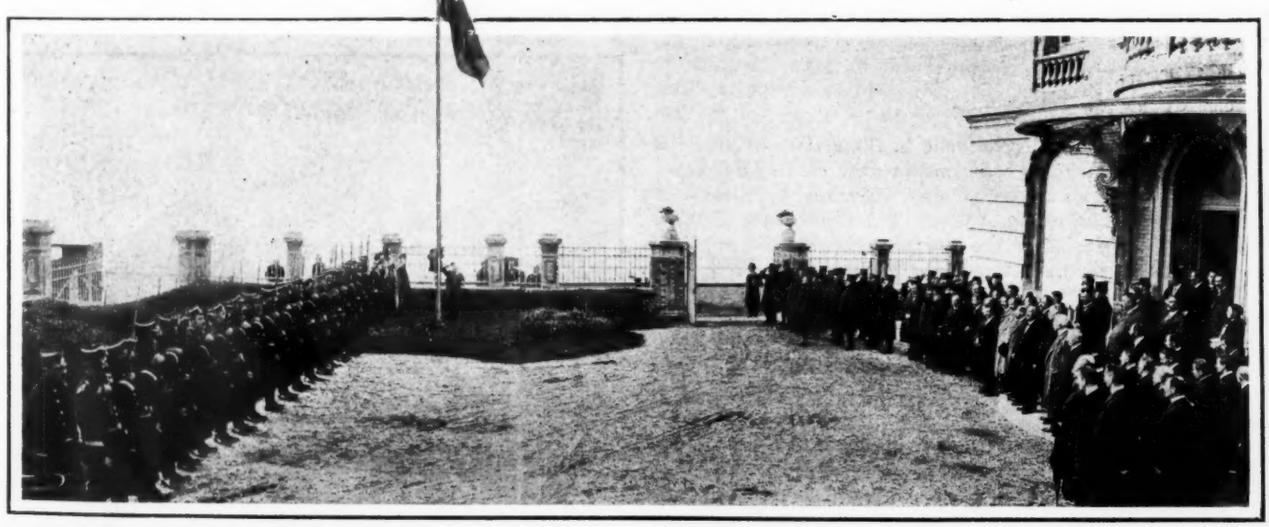
It being anticipated that the 1,100 Paris motorbuses now with the French armies will never again see service on the streets of the capital, arrangements have been made for a new fleet to be prepared. The new motorbuses will be single deckers, with motor under the driver's feet. The width and height are to be increased, while the windows on one side will be fixed. It has been found possible to decrease the weight 1,500 pounds. The acetylene lighting set has been replaced by electricity.

Since the outbreak of the war there has been no bus service whatever in Paris, the whole of the vehicles having gone on their war mission within 24 hours of the declaration of mobilization. The buses have given remarkably good service, mechanical breakdowns being exceedingly rare, whereas private trucks have had to be abandoned by the roadside. There does not appear to be a single case of a bus having gone out of business by reason of mechanical weakness. Naturally some have been lost by reason of shell fire and road accidents, but these had no connection with mechanical breakdowns.

After practically 3 months' hard service, during which they have never been under cover, it has been decided to send the motorbuses back to their base in small batches for a mechanical inspection and the fitting of new tires.

250 Motors Feed 750,000

As meat wagons, in which service most of the Paris buses are employed, it is possible with 250 buses to feed daily 750,000 men. In order to assure absolute reliability, however, 500 buses are made use of for this number of men. Each bus can carry daily about 4,000 pounds of fresh meat to the firing line. This quantity of meat is sufficient for a regiment comprising three battalions of 1,000 men. The daily ration of fresh meat is about 1 1-3 pounds per man. Twelve buses are capable of supplying an entire army corps with fresh meat, but in order to allow for unforeseen circumstances this number is doubled.



A daily ceremony at the Belgian Ministry of War in Havre, France. As the Belgian flag mounts to the top of the pole, the Belgian Guards and officers of the general staff salute it and swear to fight till death in defense of their country

Paris mail van used for delivering letters to men on the firing line

Armored Cars the Allied Armies' Greatest Requisites

PARIS, Oct. 28—Automobiles fitted with machine guns and armor plating for touring cars have proved to be the two greatest requisites of the Allies in this war. It is now evident that the German military authorities had realized the immense importance of possessing guns with greater mobility than can be obtained from the use of horses. On the outbreak of war they had large numbers of cars, each one carrying a rapid firing gun, with complete protection by means of armor plating, by means of which they were able to make rapid invasions into the enemy's country and to inflict enormous damage. There is no doubt that the value of these guns was enhanced 100 per cent. by reason of their extreme mobility. Officers of the Allied forces have declared that again and again their infantry have got within striking distance of the German automobile guns, but have been unable to capture them.

Four-Wheel-Drive in Demand

Although the French had studied this problem of armored automobiles, and had produced a most efficient type, only a very small number were ready to go into active service on the outbreak of war. More attention had been paid to the haulage of heavy guns—about 6-inch bore—by means of four-wheel-drive gasoline tractors, in place of horses. These have given satisfactory service.

Chassis Haul Guns

In England little had been done in the matter of armored cars. Some satisfactory experiments were carried out early this year with hauling guns long distances by means of powerful Sheffield-Simplex chassis. The significance of these experiments is shown at the present time by the appointment of one of the most important financial backers of this company as head of the mechanical transport service of the British army on the Continent. Under the Sheffield-Simplex scheme the guns were merely towed behind ordinary chassis. The experiments proved that guns could be hauled in this way, over medium roads, at an average speed of 30 miles an hour.

With wonderful rapidity the conditions pertaining at the outbreak of the war have been changed so that the Allies doubtless have now more armored automobiles than are possessed by Germany. No figures are available, but it may be stated that hundreds of automobiles have been fitted with guns and encased in plating. One firm alone delivered 200 chassis to the arsenal to be fitted up in this way. So strong is the faith in the automobile gun that certain officers have had guns sent out to them from England, apart from the official channels, and have had them fitted to armored cars. The English and French naval brigades have a particularly strong equipment of these machines.

Design of Armored Car

There is no uniformity in the design of the new military weapon. Two-ton trucks, as well as powerful touring cars on pneumatic tires, are made use of. Various types of guns are fitted. The point is that any gun is rendered immeasurably more useful by being mounted on an automobile. The nature of the armor plating varies from a complete housing, covering the hood, wheels, driver, and forming a turret for the gun, to ordinary trucks with a steel plate along each side, over the top of which the gun is fired.

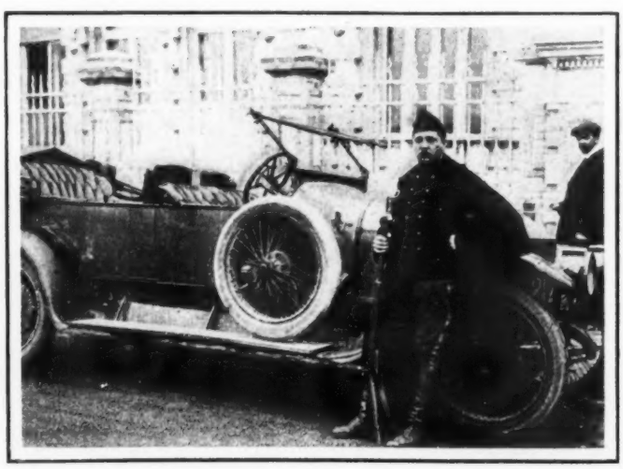
The cooling problem is overcome by hinged doors in front of the radiator, or by steel louvers capable of being operated from the driver's seat. On the lighter type of machine the tires are protected by a front and rear extension of the fenders, special steel being used, and the sides being left unguarded.

The more elaborate of these automobiles have a set of struts, or jacks, raising the entire chassis from the ground and giving it a greater amount of rigidity than it can possess when on its wheels with springs interposed. The rapid raising of the chassis, so as to transform it into a rigid platform, is one of the features and secrets of the vehicle.

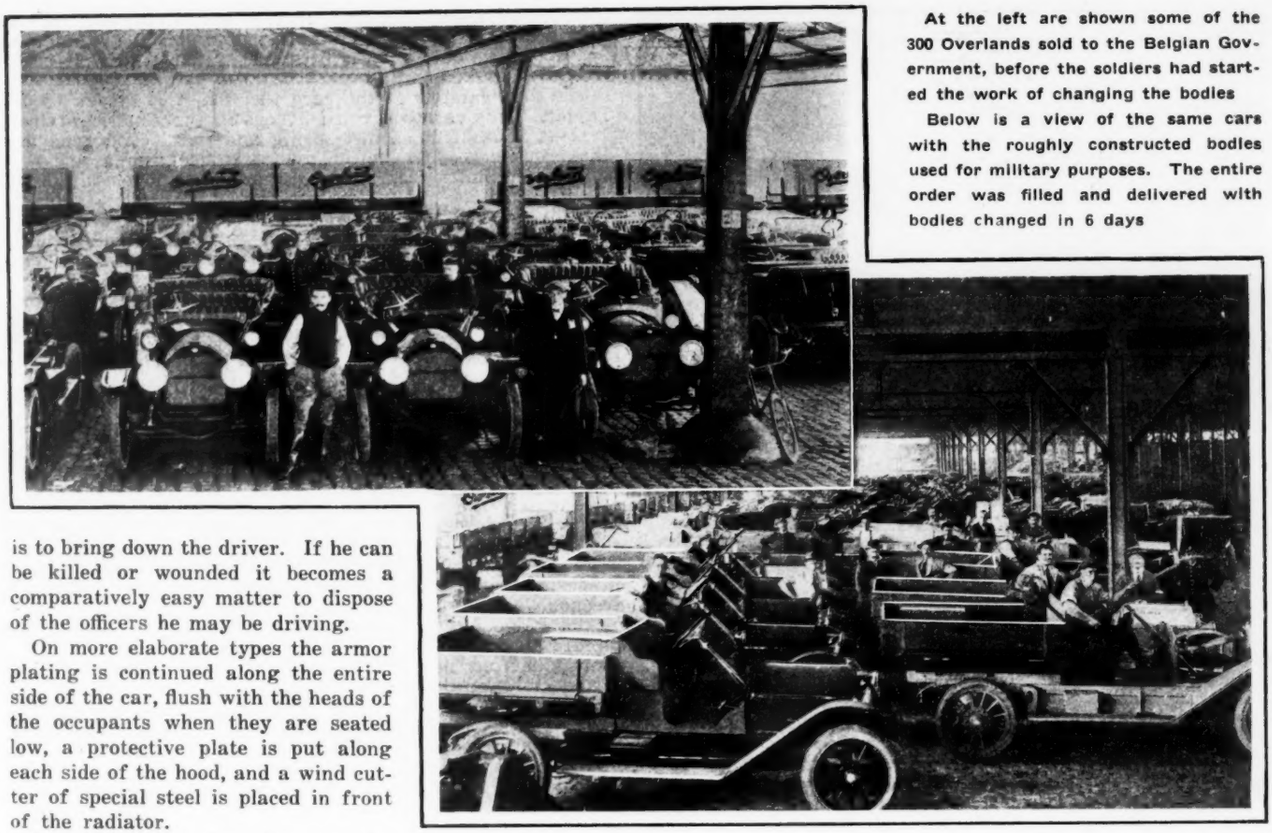
Protect Radiator and Driver

All touring cars in use at the front should have a certain amount of protection, particularly for the driver and for the radiator. Many of the cars which were sent out unprotected have since been transformed in order to give this additional security. This protection need not be of an elaborate nature, indeed it must be as simple as possible in order not to rob the car of any of its usefulness as a rapid means of conveyance. The object is to make the car proof against rifle bullets and splinters of shrapnel. It is obvious that no automobile can be made proof against shell fire and remain a fast vehicle.

The most important feature is the protection of the driver. This has been done in many cases by mounting a chrome nickel steel semi-circular shaped plate on each side of the body, level with the men in front, and slightly above their heads. This gives sufficient protection against side attacks, which are the most common, and is in many cases considered sufficient. In every case the object of an attacking party



A soldier of the Belgian Guards on duty before the official car of the Belgian Government in front of the provisional headquarters at Havre



At the left are shown some of the 300 Overlands sold to the Belgian Government, before the soldiers had started the work of changing the bodies

Below is a view of the same cars with the roughly constructed bodies used for military purposes. The entire order was filled and delivered with bodies changed in 6 days

is to bring down the driver. If he can be killed or wounded it becomes a comparatively easy matter to dispose of the officers he may be driving.

On more elaborate types the armor plating is continued along the entire side of the car, flush with the heads of the occupants when they are seated low, a protective plate is put along each side of the hood, and a wind cutter of special steel is placed in front of the radiator.

There is some necessity, too, for protection of the gasoline tank, if at the rear, for cases have arisen in which this has been punctured by bits of shrapnel. A gasoline tank under the dash hardly needs any special protection. The tendency is to put as little armor plating on touring cars as possible. If the driver is tolerably safe the other occupants may take the risk.

Reverse Driving

It has been proved that on touring cars serving for reconnoitering purposes a highly geared reverse and a duplicate steering set, allowing the car to be driven stern first, are most valuable adjuncts. On this type of car there are two reverses, a low and a high, and a duplicate set of spark and throttle controls on the emergency reverse steering wheel. For raiding purposes this type of vehicle is invaluable. It can run into positions which the driver of an ordinary car would consider extremely dangerous and can get away again with ease. The amazement of the attacked troops is great on finding that the attacking car can move astern as fast as it has come ahead.

300 Overlands for Belgium

A big squadron of 300 Overland cars is one of the factors in the remarkable resistance being made by the intrepid Belgians against the overwhelming forces of the Kaiser.

The Overlands were used continuously during the retreat from the city.

The cars were purchased shortly after the actual opening of hostilities from the stock of the Willys-Overland, Ltd., London distributor, by a commission of army motor experts headed by Colonel Jammott, chief engineer of the Belgian artillery.

A number of motor cars and light trucks figured in a series of exhaustive tests held to determine the ones best fitted for rigorous service in the field. In the course of the trials an Overland car, equipped with a special military body prepared for the purpose, traversed the long Hampstead Hill in this city, on high speed, carrying a load of petrol approximating 1,900 pounds. The resultant sale was the largest individual order for cars ever placed with a single firm in the history of the automobile industry in England.

Immediately after the tests the Belgians ordered 200 Overlands. Although this was the entire number of cars they had been authorized to purchase for their Government, they found the machines so satisfactory for their purpose that a second order for 100 additional cars of the same make followed shortly after the officers had made their report to headquarters.

Bodies Made in 6 Hours

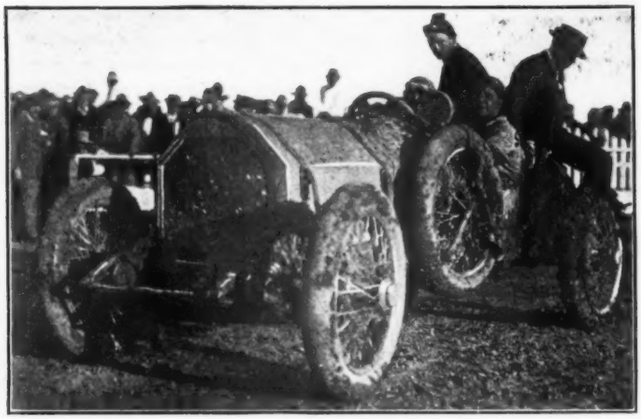
On the same day that the first order was received a prominent London body manufacturer started the construction of bodies for military use, using the specifications laid down by the Belgian engineers. As time was urgent, an extra force of men was kept in the factory night and day until the entire allotment had been finished. Under this pressure the English workmen required but 6 hours to turn out a complete body.

Together with the cars the bodies were shipped to Antwerp aboard a channel boat chartered especially for the purpose. Accompanying them were ten expert mechanicians from the London establishment and a score of men from the body shop.

The touring car bodies were discarded and the hastily constructed military bodies attached to the chassis in their place. In a remarkably short space of time the entire task was completed and the 300 cars were ready.

300 Cars Ready in 6 Days

Within 6 days after the first order was placed the 300 cars, altered and adapted to military service, had been officially turned over to the Belgian army, together with a proper assortment of duplicate parts. The mechanics remained in Belgium for several days after the cars had been placed in service to assist in training the soldiers in driving and caring for the cars.



Barney Oldfield's Stutz as it won the Los Angeles-Phoenix race

Eight Finish in Big Desert Race

Twelve Cars Eliminated by Gruelling Grind— Oldfield, in Stutz, Wins

PHOENIX, ARIZ., Nov. 11—Eclipsing all past revivals of the great desert classic, the seventh annual Los Angeles to Phoenix road race passed into history with Barney Oldfield the winner.

Twenty cars started from Los Angeles Monday morning, November 9 at daybreak. One by one they were conquered by the desert and mountain roads until there were only eight in the running and one arrived at the finish line after the control had been officially closed.

For 3 days, Oldfield in the Stutz racer which was the first American car to finish in the International Sweepstakes at Indianapolis last May, led the field. At Needles, the first night control, Barney had the lead by a scant 5 minutes and 55 seconds. At Prescott, the second night out, the Stutz was 48 minutes ahead and at the finish of the 696-mile battle with the elements, the veteran took first honors over Louis Nikrent in a Paige, by just 35 minutes.

With the first money, Bullock's, Gondolfa's and the Arizona Republican trophies, Oldfield wins the diamond trophy bearing the inscription, "The Master Driver of the World."

By winning the "Cactus Derby" in a tuned racer, Oldfield has wrecked sacred Western racing traditions. Never before has a racing car made good in the Phoenix road race.

The Paige cars which won second and third places in the great race also created a sensation.

The little Chevrolet also made a great showing and the 1911 Cadillac, piloted to fifth place by the veteran Bill Bramlett, was a wonder of the race.

The battery of racers that lined up for the start November 9 included everything from the Ford and Metz to the Simplex and De Dietrich.

At midnight rain began falling. By the time that the first car was to be sent away, at 5:30, the course for the first 61 miles to San Bernardino was positively dangerous. The drivers who had them put on chains.

Ford Led to San Bernardino

The cars were sent away from the line at 2-minute intervals. As far as San Bernardino, they held very close together, several checking in at that point only seconds apart. Earl Schnack of Escondido, Cal., in the little Ford, led the race to San Bernardino by 3 minutes, and was still in the counting, 100 miles out; but the little machine met disaster before the first day's run was over.

The first car out in the race was the Alco driven by Bill Taylor. This car took third honors in the American Grand Prix at Santa Monica last spring and was looked upon as a dangerous contender until Taylor skidded into a telegraph pole, a few miles from the start, and was hopelessly out of the running.

Many cars had trouble in the narrow Cajon Pass. Several skidded over the edge of the road, although with the exception of the Alco and the Metz No. 11, all cars reached Victorville, 102 miles out on the desert.

Durant in the Chevrolet No. 2 and Barney in the Stutz, checked in and out of Barstow not a minute apart, and from that point on across the desert to Needles one of the most spectacular road races ever witnessed took place.

Oldfield in the Lead

Oldfield led. Sometimes the Chevrolet would almost overtake the Stutz. The third car, the Simplex with Olin Davis at the wheel, would come out from behind a jagged butte and all but pass the leaders, then would settle back and hold its own against the rest of the field. At Needles, the Chevrolet and Stutz were so close together that when Oldfield ran over the line he had to back back till the Chevrolet was checked in. While Oldfield had a five minute lead in time, he was second in position at the end of the first day's run by just eight seconds.

The Paige No. 1 finished third followed four and a half minutes later by Davis in the Simplex 4 minutes ahead of Louis Chevrolet in the Chevrolet No. 20 which he had pushed to the limit for the entire 303 miles.

The de Dietrich, KisselKar, Thomas and Ford all went out on the run between Barstow and Needles. This left but fourteen cars in the race and when the start was made the next morning, the Metz No. 14 went out.

Louis Nikrent in the Paige No. 8 finished the first leg of the course 1 minute behind the Chevrolet, but he had stopped outside of the control to fill up, tighten a few bolts and make ready for the start in the morning.

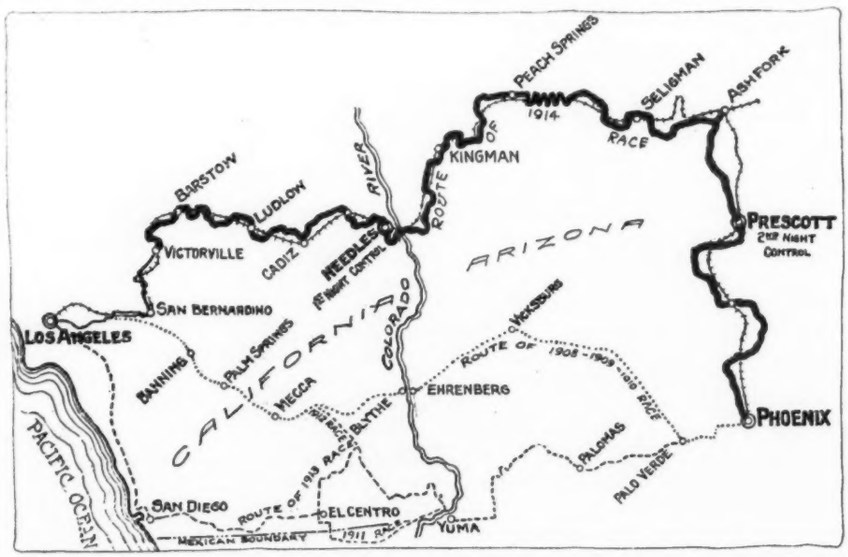
Rain was falling at the time of the start from Needles. The cars skidded from side to side over the muddy mountain roads to the Santa Fe bridge which crosses the Colorado River 17 miles below Needles.

Crossing the bridge, Durant lost 6 minutes making a tire change. Oldfield had trouble getting water in his radiator, having screwed the cap on too tight the night before and he also lost time after the start, giving both Beaudet and Davis several minutes' start.

Nikrent, Carlson and Chevrolet all crossed the bridge together and raced across the roads to Kingman.

The speed of the Simplex came in for a show on the road to Kingman after the dust had been laid and Davis led into the 374 mile control with 8 minutes on Oldfield.

At Kingman Oldfield discarded the wheel with the flat tire which he had driven 11 miles in a losing speed brush with



Map of course followed by contestants in the seventh annual Los Angeles-Phoenix race

Nikrent, and lost more time. Durant also suffered in a duel with the other Paige.

As Beaudet bowled along with Durant chasing him at about 60 miles an hour the Chevrolet struck a rock and the right rear wheel was badly damaged. However, Durant drove into the control only 10 seconds behind Beaudet.

Leaving the Kingman control in second place with several minutes over both Barney and Durant, Beaudet skidded to the side against a bank and sprung a leak in his radiator.

Back to Kingman he drove and while he was patching the hole, Barney and Durant pulled out together and Nikrent went into second place, 5 minutes behind the Simplex.

Louis Chevrolet, Bill Carlson and Du Bois in the Cole, left Kingman close together.

At Hackberry, Carlson broke a wheel on his Maxwell. Teddy Tetzlaff in the Maxwell Press Car overtook him and taking the wheel into Seligman the damage was repaired but when the driver returned to his car at Hackberry, he found it stripped of carbureter, magneto, all tires and the two extra wheels which also carried two extra tires. That ended the game for the Maxwell.

Regular Storm at Seligman

The rain increased until there was a real storm at Seligman, Davis in the Simplex cut a piece of the tread off his left rear tire and stopping to change wheels and buy rubber coats for himself and Redford his mechanic, Barney went through the town and into first place, followed by Nikrent who had also stopped at Seligman to fill up for the hard run over the mountains to Prescott.

Anxious to assist Chevrolet one of the natives picked up the wrong can and poured 5 gallons of water into the gas tank of the Chevrolet No. 2. This was not discovered, however, and a few miles out, the car refused to move. Marooned in the rain on the desert, Louis was finally overtaken by the crippled Chevrolet No. 2. Taking a wheel off of the waterlogged car, No. 2 was soon in running condition.

Oldfield was first at Prescott, the second night control, with a lead of 48 minutes and 5 seconds over the Simplex. Nikrent held third place, 8 minutes behind Davis.

Eleven Cars Reach Prescott

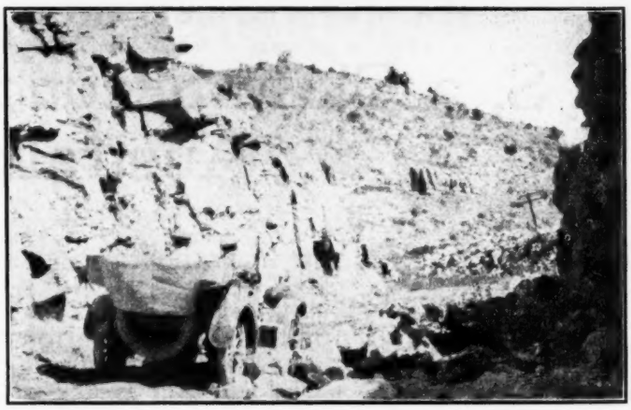
The eleven cars which reached the 558 mile post at Prescott were all in good condition with the exception of Beaudet's Paige and it was still anybody's race. Another leaky radiator robbed Beaudet of enough time to put him in second place.

At New River, 15 miles out of Phoenix, Barney stalled his motor in the middle of the stream and had to hitch ropes on the car and have spectators and a team assist him through the wet sand. Fifteen minutes were lost at this point and

Time of Cars Finishing in Los Angeles-Phoenix Race

Car	Driver	Los Angeles-Needles	Needles-Prescott	Prescott-Phoenix	Los Angeles-Phoenix	M.P.H
Stutz	Oldfield	8:45	8:18	5:56	23:00	30.2
Paige	Nikrent	9:25	8:35	5:35	23:35	29.4
Paige	Beaudet	9:14	9:58	5:51	25:04	27.7
Chevrolet	Durant	8:51	10:27	6:27	25:46	27.0
Cadillac	Bramlett	10:02	10:38	5:40	26:20	26.2
Buick	Ellis	11:00	10:14	6:44	28:22	24.5
Stutz	Burns	10:17	11:15	8:16	29:48	23.4
Cole	Du Bois	9:44	14:31	7:41	31:56	21.8

Picturesque scenery and Mojave Indians on Los Angeles-Phoenix race course



Rough going through Rocky Canyon on the Los Angeles-Phoenix race course

Barney felt that he had lost the race. Nikrent had passed him and Bramlett in the Cadillac No. 20 had pulled through the stream several minutes ahead of him.

Oldfield's Winning Spurt

Heedless of danger, Oldfield slid from side to side on the road in a mad drive to the tape, hoping that he would win at least second place, but believing that he had lost to Nikrent.

As he came down the road, the car and crew looked like an adobe house on wheels. The cigar in his face had turned to a clay clod and the mask on his face had holes where mouth and nose were hidden.

The first to finish was Nikrent and as the crowd waited for the next car seconds were counted, as each minute counted in the fight for the "Master Driver's" title.

Bramlett in the old Cadillac was the second man to finish. A short distance out of Prescott the Cadillac went over a 12-foot embankment. The rains had made the mountain road so slippery that Bramlett's brakes would not hold. A crowd of spectators assisted the driver and mechanic to get the car back on the road, but the steering arm was so bent that Bramlett could hardly turn to the left and later the arm broke off.

Without a word, Bramlett tore two rails from a fence and giving one to his mechanic, the damage was repaired. Lashing a rail to either side of the front axle, the driver and mechanic steered the last 15 miles to the finish, traveling at about 30 miles an hour, by leaning over the side and rubbing the rail on either side of the tires.

The Simplex was eliminated from the running when a few miles out of Prescott. In second place with an even break for first honors, Davis broke a torsion spring and drive chain, skidding into a bank and retiring from the lists.

Durant and Chevrolet in the Chevrolet No. 2 were making fast time between Wickenburg and Hot Springs Junction when they lost a hub. Taking a wrench, they improvised a hub by tightening and lashing it down with tape. With this makeshift they were only able to make about 20 miles an hour, but they fought to the finish and beat Bramlett out of fourth place by a margin of 34 minutes.

The Buick No. 15 ran in hard luck throughout the race. Just out of Los Angeles the Ellis brothers went into the ditch. They got back into the race and continued on to Daggett where they again went in the ditch. Never able to regain the lost time, the boys finished 2 hours out.

Not willing to give up the race, the Metz No. 9 made the run into Prescott and started out on the last lap of the course with Wing determined to reach Phoenix, which he did at midnight.

The Kincaid special followed along in the wake of Barney in good time until about 60 miles out of Phoenix. A twisted axle stopped its career.

The Cole, entered and driven by Bu Bous of Phoenix, the only Phoenix car in the race, fought to the finish.

The Stutz No. 17 did not get through as well as Barney's No. 5, but the car reached Phoenix after a hard race.

Oldfield did not make the time that Olin Davis in the winning Locomobile did last year; but the course was harder on account of the rains. Davis' time for the run over the 564 mile course by way of San Diego and the Imperial Valley was 31 miles an hour. For the first 300 miles, Oldfield averaged 38.4 miles an hour. The second day he fell back to a 31.5 average and the last lap was below 30 miles.

U. S. a Close Second to Great Britain for Australian Trade

Leads by 1 Per Cent. in Importations of Chassis and Bodies in First 6 Months of 1914—English Imports Worth $455,100 More—European War Depresses All Business in Antipodean Continent

THE European war has made a terrible depression in Australia. From the very day that England declared war, automobile business went flat, and no one had any consideration for anything else except war news.

The country has been in a state of financial nervousness ever since the war started, but it is beginning to show signs of a slight recovery. Just how long the recovery will last it is hard to say at this present moment. What has troubled the country most, has been the disposal of wool, which has stopped, and wheat is being cornered or commandeered by the Government. It is almost impossible to buy any motor trucks, as the military authorities have taken everything. The Government is taking all kinds of steps to prevent monopolies coming in and cornering commodities. As a consequence, the capitalists and speculators are all standing aloof and doing nothing, thus affecting the automobile trade and everything else.

Export Trade Stopped

The stoppage of the export trade has created a natural depression in the factories. This condition is prevailing throughout Australia, but it is not affecting New Zealand so much. The war has come when normal conditions should have prevailed, with the usual run of prosperity, although one or two parts of the Continent have had a rather dry spell.

U. S. Leads by 1 per Cent.

This condition of affairs has affected, particularly, the automobile export business from the United States and the United Kingdom. Both these countries have had a large export trade in automobiles and parts with Australia. In fact, for a number of years it has been a close race between the two for supremacy in that particular trade, the United Kingdom always leading. But in 1914, the United States came to the fore, leading that country by 1 per cent. in the total importations of chassis and bodies and supplying 32 per cent. of the total importation. The value, however, of the English cars was $455,100 more than the American, amounting to $1,491,525; the American, $1,036,425. During the first half of 1913 the United Kingdom led the United States by 5 per cent., or 36 per cent. of the total importation.

During the first 7 months of 1914, 2,587 cars, valued at $2,233,471 were exported to Australia, as compared with 1,873, valued at $1,827,690, for 1913, a gain of 22 per cent.

July Exports Increase

Even the July exports show an increase. Cars numbering 311 and valued at $237,780, were exported, as compared with 277, valued at $240,734, for 1913. These figures would indicate that low-priced cars are gaining a strong foothold there. In speaking about these cars, it may be said that the small European car is most popular in the cities, while in rural sections, the American car is in greater demand.

$8,000,000 in 5 Years

American exports into Australia since 1909 have amounted to more than $8,000,000. This country has shown a most remarkable increase. From the figure of $50,625 in 1908, this value has risen to $1,433,320 or nearly thirty times its magnitude. None of the other countries has made nearly the same progress.

Australia, as an automobile buying territory, has made most astonishing headway in the last 6 years. Agriculture, mining and a variety of industries make that country a territory of considerable buying power. That the automobile industry is getting its share is shown in the importation of $3,996,945 worth of automobile chassis and $703,125 automobile bodies in the first 6 months of this year, a total of $4,700,070.

This country, made up of six states, New South Wales, Victoria, West Australia, South Australia, Queensland and Tasmania, has a population of 4,830,517. Though about one-third the size of South America, American automobile business there in 1914 was thirty times that of South America.

American Bodies Lead

The importation of American bodies has been far ahead of any of the countries, dating as far back as 1911. For 1914, Australia imported nearly $150,000 worth more of American bodies than English. The United Kingdom, however, has always led this country in the number of chassis imported, this year's lead being $98,535. This figure, however, shows that the United States has made a great increase over 1913, the United Kingdom then leading it by $451,110.

Tires Poorly Represented

Though the American importations were second, it may be said that these could have been considerably increased, had attention been paid to tire equipment. A number of the American manufacturers sent their cars over to that country without tires while the European cars were equipped with those guaranteed in Australia. Though some of the American cars were so equipped, no guarantee was given. The reason for this is that only one tire company is represented there. This American company is not nearly as well established as any of the European firms. A number of the European tire companies are building factories to take care of the large trade. The question of tires to the consumer in Australia is a very important one, because of the high import duty.

Greater Increase Than England

The United States showed a better increase in 1914 than England, that is, averaging both the body and chassis imports. The American increase in 1914 over 1913 was 48 1-2 per cent., while that of England was only 6 per cent. The American 1914 increase for body imports over 1913 was 44 per cent., while the chassis import increase amounted to 53 per cent. The English increase in body imports was only 7 per cent., while the chassis imports gained 5 per cent.

New South Wales Buys Most

New South Wales is the largest automobile buying state of Australia. The 1913 imports amounted to $2,581,555 in 1913. These figures include both chassis and bodies, the last named amounting to $358,013. The large demand for bodies is explained as being due to the local demand for low-priced American cars, which are sold for delivery there complete and ready for use. The United States sent chassis valued at $646,038 to

that state during 1913. Over $445,000 worth of chassis and over $120,000 in bodies came there from this country during the first 6 months of 1914. England sent over $85,000 worth of bodies and over $470,000 in chassis, leading the United States in the last named. The increase in that state in American cars for the first 6 months in 1914, including both bodies and chassis, was 48 1-2 per cent., while the English increase was 17 1-2 per cent.

Queensland's Increase Best

Queensland, though second to New South Wales in the number of chassis imports, showed the best increase for 1914. This was 37 per cent. New South Wales was next with 33, Tasmania, the smallest state, next with 30; Victoria, 16; West Australia, 10, and South Australia, only .003.

U. S. First in New South Wales

In point of numbers in New South Wales, America takes first place, the Ford registrations totaling 1,043. Overland carries off second place with 434. Third place goes to Europe, the Renault having 345. In the last official report of automobile registrations for this state, the figures show that 79 per cent. of the cars sold have gone into the country districts where farming and pasturage constitute the chief occupations. With this class of population purchasing practically 80 per cent. of the cars, it is not surprising that the low-powered and medium-powered cars should lead.

Canada Leads France

The accompanying statistics show Canada and France well up in the list, the first country leading. France, for 1914, has declined, while Canada has gained almost 70 per cent. over 1913 in chassis imports. Canada also leads France in body imports. France has also declined in body imports.

Information about Australia is constantly coming in, especially through the United States Consulates, established in the various cities. It will be advisable for any manufacturer who desires to export to the Australian continent, to communicate with the Department of Commerce and Labor, Washington, D. C., for information regarding the local conditions.

Plans Trade Tour

BALTIMORE, MD., Nov. 14—The Fidelity Trust Co. has arranged for a 16,130-mile tour around South America, starting from New York City, January 27, and Baltimore, January 29, and lasting 106 days, 32 days of steaming time and 54 in the principal ports of the West Indies and South America. This tour is arranged to enable our bankers, manufacturers, exporters and importers to familiarize themselves with South America.

Automobile and Motor Truck Chassis and Bodies Imported Into Australia in 1913 and First 6 Months of 1914

1914—First 6 Months

BODIES FOR AUTOMOBILES AND TRUCKS

Country of Origin.	N.S.W.	Vic.	Queensland.	S. Aus.	W. Aus.	Tas.	Commonwealth.
United Kingdom	$88,345	$43,650	$14,845	$27,125	$10,450	$8,020	$192,435
Canada	41,630	33,225	17,860	25,815	8,385	7,090	134,005
New Zealand	225	110	...	...	...	...	335
Austria	...	380	...	...	...	...	380
Belgium	550	1,750	395	...	...	...	2,695
France	3,090	5,570	680	1,095	910	60	11,405
Germany	7,880	2,910	405	745	...	280	12,220
Holland	...	180	...	...	...	...	180
Italy	8,070	2,180	...	1,120	2,230	...	13,600
U. S. A.	124,125	57,025	76,740	49,920	22,815	5,245	335,870
Total	$273,915	$146,980	$110,925	$105,820	$44,790	$20,695	$703,125

1914—First 6 Months

CHASSIS FOR AUTOMOBILES AND TRUCKS

United Kingdom	$470,120	$459,810	$94,100	$184,260	$49,030	$41,770	$1,299,090
Canada	207,990	193,195	70,250	94,060	31,575	27,950	625,520
New Zealand	7,745	750	...	...	...	...	8,495
Austria	...	1,560	...	...	...	...	1,560
Belgium	50,850	27,705	5,140	3,755	30	...	87,480
France	86,310	192,140	8,650	31,425	8,605	6,220	333,850
Germany	101,665	117,885	9,500	12,395	195	4,255	250,905
Holland	...	475	...	...	...	...	475
Italy	83,025	84,685	2,995	9,325	5,025	...	185,055
Switzerland	...	3,960	...	...	...	...	3,960
U. S. A.	447,740	253,470	233,255	157,245	83,575	25,270	1,200,555
Totals	$1,460,455	$1,336,635	$423,890	$492,965	$188,035	$105,965	$3,996,945

1913

BODIES FOR AUTOMOBILES AND TRUCKS

Commonwealth	$825	$100	...	...	...	...	$925
United Kingdom	73,470	49,470	$10,795	$22,875	$15,065	$7,720	179,375
Canada	15,565	33,490	3,545	22,990	13,095	360	88,845
New Zealand	275	...	...	...	...	...	275
Belgium	140	1,965	...	905	20	...	3,030
France	10,080	7,550	215	1,710	70	530	20,155
Germany	5,885	6,825	745	1,080	145	130	14,810
Italy	1,740	...	...	...	...	...	1,740
Netherlands	455	...	...	...	...	...	455
Norway	...	6,795	...	...	...	...	6,795
U. S. A.	83,430	55,425	42,125	29,325	14,250	8,310	232,865
Totals	$191,865	$161,620	$57,425	$78,665	$42,645	$17,050	$549,270

1913

CHASSIS FOR AUTOMOBILES AND TRUCKS

United Kingdom	$408,115	$394,350	$131,050	$196,720	$59,160	$43,300	$1,232,695
Canada	96,060	131,790	14,450	93,440	43,220	4,670	383,635
New Zealand	1,700	...	...	...	...	...	1,700
Austria	24,240	...	...	...	...	...	24,240
Belgium	...	53,840	6,155	16,365	1,485	1,760	79,605
France	115,405	157,870	8,380	63,615	1,430	12,225	358,925
Germany	75,760	67,545	2,775	6,825	1,440	860	155,205
Italy	78,210	128,665	...	5,025	...	...	211,400
Netherlands	2,200	...	...	...	...	...	2,200
Sweden	1,700	...	...	...	...	...	1,700
Switzerland	1,200	24,635	3,230	14,935	3,260	...	47,260
U. S. A.	488,290	187,630	142,840	94,450	50,290	18,085	781,585
Totals	$1,092,880	$1,140,825	$308,880	$491,370	$160,285	$80,905	$3,380,150

Russian Imports Gain $184,000

Progress Shown in First 5 Months of 1914

THE accompanying table shows the imports of various kinds of motor vehicles into European Russia in 1912 and 1913 and during the first 5 months of 1913 and 1914 respectively.

The number of automobiles imported was 5,350 in 1913, compared with 3,428 in 1912. The increased imports of trucks and chassis in 1913 may be explained by extensive orders from the Russian War Dept., but the great increase in the total imports is largely due to the Petrograd exhibition held for the first time this year.

Kinds	1912	1913	Jan. 1-June 1, 1913		Jan. 1-June 1, 1914	
	Value	Value	Number	Value	Number	Value
Automobiles:						
With 4 or more seats	$4,863,000	$7,511,000	1,754	$3,161,000	1,816	$3,543,000
With less than 4 seats	324,000	593,000	282	321,000	121	124,000
Trucks and chassis	331,000	717,000	516	352,000	315	280,000
Motor cycles	226,000	298,000	1,145	175,000	1,429	246,000
Total	$5,744,000	$9,119,000	3,697	$4,009,000	3,681	$4,193,000

Weight, Not Volume, of Air and Fuel Determines Proper Carburetion

The Automobile Engineers' Forum

Factory Engineer Points Out That Carbureter Adjustments Are Designed to Compensate for the Effect on the Mixture of Variations in Temperature and Pressure

By Frederick Purdy
Factory Engineer, Findeisen & Kropf Mfg. Co.

CHICAGO.—Editor THE AUTOMOBILE:—Concerning the relative merits of an adjustable and non-adjustable carbureter much can be said, but before going very far in this subject I want to say a few words as to the meaning of adjustable.

It must not be assumed that because there are screws that can be turned, that it is necessary to turn them. A carbureter with any number of adjustable places may be quite as fixed a proposition, after having once been adjusted, as a carbureter with rigid unalterable openings, the size of which is determined at the factory.

The impression seems to prevail that carbureters, which have the means of adjustment, must therefore, be adjusted at frequent intervals, apparently on the ground that nothing shall be wasted.

"If you have shoes, wear them; if you have a hat, put it on; if you have an adjustment, adjust it," seems to be the logic.

Why Motors Vary

It is rarely the case that two motors of the same design and built at the same time, are absolutely alike. Cylinder cores shift slightly and vary the compression space. If the manifold is cast as a part of the cylinder block, or separately, it is not always of the same area. Some present more or less friction to the movement of the air than others, and both compression and intake manifold conditions, influence carburetion. And the influence of the exhaust valves and the manifold must not be ignored.

However much care is exercised, cams are not always alike. This influences the lift of the valves, and in order to make them quiet, road testers will give more or less clearance to the tappet, which not only varies the lift of the valve, but also its timing. All this influences carburetion, so that even if a carbureter may be made for a particular motor, it may require some little variation in the carbureter itself to compensate for the accidental variables in the motor. Hence the necessity for providing these adjustments.

After the carbureter has been adjusted to its particular motor, it may be quite as fixed as though the openings had been drilled at the factory to a definite size, so that an adjustment does not, necessarily, mean something that is to be continually tampered with, but may be a provision for obtaining the highest possible efficiency from any particular motor on which the carbureter may be mounted.

It is not contended that carbureters made without the possibility of adjustment, cannot function properly. It may happen that the carbureter and the motor may be exactly adapted to each other. I said "happen." If they don't happen to harmonize, then the adjustment on the carbureter will compensate for the error. If there is no adjustment, then an inferior performance must be expected, or another combination of motor and carbureter looked for.

A properly-designed carbureter, having been adjusted once to a motor, could have its adjustable parts soldered, and it would then be quite as simple as if it were made without an adjustment at the factory, and if to make his product fool-proof is the aim of the carbureter manufacturer, he would have attained the same end should he have made his carbureters adjustable and adapt them to the motor, and then remove the possibility of further adjustment.

WILL A CARBURETER AND A MOTOR WORK TOGETHER PROPERLY WITHOUT ADJUSTMENT IN ALL CIRCUMSTANCES IN WHICH THEY MAY BE PLACED?

It is the office of the carbureter not only to partially or completely, if possible, vaporize the fuel, but to properly proportion it to the air. The proper proportions, however, should be based on the weight of the air and the fuel and not on the volume. It is the mass, and not the space the mass occupies, that determines its relative value.

To be explicit: A certain weight of gasoline should be mixed with a certain weight of air to produce a proper firing mixture. Unfortunately we are dealing with an incompressible liquid, the volume of which is varied only by temperature, and a gas, highly elastic, the volume of which is varied by pressure as well as temperature.

The Ideal Carbureter

A theoretical carbureter should, therefore, weigh out air and fuel and mix them. Then adjustments would not be necessary to compensate for different altitudes.

With such a device, a car should run as well at Palm Beach, Fla., or Helena, Mont., because, although the air is more rare at Helena, the proportioning device would take in a greater volume of air to gasoline at Helena than it would at Palm Beach.

In either place it would take in as many pounds of air per pound of gasoline, but, unfortunately, the light of present knowledge is not bright enough to show us a way to do this thing without complications and a mechanism so intricate and delicate that its use on a motor car would be absurd.

So, we perforce, resort to mechanisms which proportion by volume rather than mass, and since the volume for a given mass varies at different altitudes for the air, but does not vary for the gasoline, the device that proportions properly in Illinois, will not give the same ratio of air to gasoline in Colorado.

HENCE THE NECESSITY FOR SOME MEANS TO ESTABLISH A DIFFERENT RATIO OF GASOLINE TO AIR BY VOLUME AT DIFFERENT ALTITUDES IN ORDER TO

MAINTAIN A CONSTANT RATIO OF AIR TO GASOLINE BY MASS AT DIFFERENT ALTITUDES.

No other factor than this need enter into the problem because it has been well established that the atmosphere has substantially the same proportion of oxygen to nitrogen at all places and elevations.

Oxygen the Re-creator

The things that make a man feel better in some localities than in others, whatever they may be, certainly do not include the proportion of oxygen to other elements in the air, and it is oxygen, and not the landscape or the service in hotels, that makes the engine run, although these other things may have a big influence on the human motor.

As stated in the outset, there may be one or two or several adjustable places on a carbureter. These may be used to establish the proper relation of the mixing device to the motor at different speeds or with different loads and to provide for acceleration and several other things that enter into the problem of properly feeding the motor. It does not follow, however, that any of them must be adjusted because one travels from Chicago at 600 feet above the sea to Leadville at 11,000 feet above the sea.

Some means must be provided, however, to diminish the proportionate volume of gasoline to air to compensate for the diminished weight of the air as the car ascends from the low prairie to the high plateau.

This is done in some carbureters, notably the Rayfield, by controlling one of the nozzles delivering fuel to the carbureter by a simple mechanism on the dash or the steering post. The other adjustments may as well be soldered tight after the carbureter is once adapted to the motor.

The pressure of air at sea level is 14.6 pounds per square inch: at Leadville, which is about 11,000 feet high, the pressure is about 10 pounds per square inch. In other words, a given volume of air at Leadville will have only two-thirds the oxygen content as the same volume of air at New York.

Therefore, only two-thirds of the volume of the gasoline required to properly impregnate a cylinder full of air at New York can be properly burned in the same cylinder full of air at Leadville, and since all carbureters, without exception, proportion altogether by volume, some adjustment, to compensate for this condition, must be provided, or the carbureter may work well in New York and badly at Leadville, or good at Leadville and badly in New York.

A recognition of this fundamental truth in carburetion would save a lot of misunderstanding, and discredit a lot of flamboyant advertising to the effect, if properly analyzed, that the carbureter advertised is not under the control of natural laws, but possessed of mystic qualities quite supernatural.

So far, I have touched merely on the proportioning of the fuel. It goes without saying that in the lighter atmosphere compression is reduced in proportion to the weight of the atmosphere, and compression is one of the factors which varies the requirements of the fuel.

The Compression Factor

I shall not attempt to say just what relation the compression does have to the proportion of the fuel, it is not necessary to even guess at it. All those who are familiar with motor construction and operation know that the statement is true, and adds another reason for some compensating device under the control of the driver.

It may be stated, with truth, that an automatic device, working on the principle of the aneroid barometer, to cut down the gasoline flow in harmony with diminished atmospheric pressure, would take care of the conditions that require a manual control for different altitudes, and thus do away with the only remaining adjustment after the carbureter had been adjusted to its motor.

To the end that no inventor runs into disappointment, after working hard on the problem, I want to say that several devices of this kind have been worked out and are in the hands of the patent attorney. None of them, however, is an unqualified success, and the present method of control is so simple, and occasion for using it so rare, that there is little reason for adding anything to the carbureter.—FREDERICK PURDY, Factory Engineer, Findeisen & Kropf Mfg. Co.

Recent Court Decisions—Train Damages Car

A RAILROAD company was not negligent for not giving warning at a crossing, as a train on a crossing is warning enough.

In New Hampshire a man hired a car for a night trip. About 11 o'clock that evening the automobile collided with the fourteenth car of a slow moving freight train at a crossing. There were no gates, lights or signals, and there was no flag man at the crossing. The night was dark and foggy and the automobile was being driven at a speed of about 14 miles per hour. The motorist brought suit against the railroad company for injuries, but it was decided that he should not be allowed to recover damages, as, in the absence of a State or Municipal provision, a railroad is not compelled to give warning at a crossing and, as the train was visible 35 feet away, the motorist should have stopped.—*Gage vs. Boston & M. R. R.*, 90 *Atlantic* (*New Hampshire*) 855.

$1,741 for an Eye

The Michigan court decides that a manufacturer must pay damages to his employees, when they are not furnished with a safe place to work.

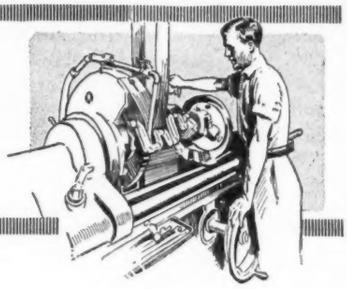
In this case one of the manufacturer's employees was struck by a flying chip from a cast iron frame, which workmen were chiselling and his eye was put out. The accident occurred while he was walking down an adjacent passageway. The employee claimed that there was a failure to provide him with a safe place to work; that the chipping was negligently done, and that there was negligence on the part of his employer in failing to erect screens and coverings, to place barriers, or to notify him of the dangerous work.

The employer, on the other hand, contended that the accident was one which could not have been reasonably anticipated; that it was temporary work which was being done unknown to him, and that the injury was caused by the act of a fellow servant.

The manufacturer was engaged in making automobiles in a large factory in Flint, Mich., and employed over 5,000 employees. It had various departments, superintendents and assistant superintendents. The assembly plant was in charge of a superintendent, and the assembly room proper was 400 feet long and 72 feet wide, with a center aisle from end to end. On the day of the accident workmen were engaged in erecting and fitting steel frames for the chassis of automobiles to rest on while they were being tested. It was found necessary to remove a triangular piece from each corner of the frame and the superintendent told his men to take it off with a cold chisel and a hammer. The man who was hurt entered the building carrying some brass and, while passing, was struck in the eye by a chip cut from the frame by the chisel.

The court held that the superintendent was the vice-principal, that is, he was the holder of delegated powers from the corporation and was not a fellow servant; that it was negligence on his part not to warn the injured man of the flying chips, or to prevent them from flying, and that the manufacturer was not relieved because the work was temporary work, and the employee could not be held to assume the risk, unless there was negligence on his part, because of his failure to notice and avoid the chips.—*Webb vs. Buick Motor Co.*, 148 *N. W.* (*Michigan*) 793.

The Rostrum



This department is conducted for the instruction of the readers and all are at liberty to ask questions. Be sure to give your full name and address in order that we may send you a reply by letter if there is no space in the Rostrum. If you wish to sign a fictitious name to a communication appearing in the Rostrum, sign this name in conjunction with your correct one.

Claims Tendency Toward Two-Cycle in Europe

EDITOR THE AUTOMOBILE:—I notice in the current technical journals there is a general tendency toward the two-cycle type of engine in Europe. There has been cited such concerns as Krupp of Germany, Carrels Fries of Belgium, Schneider et Cie., France, and Sulzer of Switzerland and numerous shipbuilders in Britain who have adopted the two-cycle. There is now a Sulzer 6,000 horsepower land six-cylinder engine in operation, so we have a power range up to 1,000 horsepower per cylinder and a 2 1-2 horsepower motor cycle. Referring to the latter *Motorcycle Illustrated* August 20, 1914, page 24, it says, "Two-stroke motors predominate for motorcycles in England. Thirty-seven out of fifty-five makers have adopted the two-stroke."

In an attempt to improve conditions in an automobile we now see eight cylinders being used to overcome the inherent defects due to cycle and yet there are concerns cited above who prefer to avoid such complication by changing the cycle (automobile engineers take notice). That this is not due to a desire to get better torque conditions and disregard efficiency is, or should be, very evident. Schneider et Cie. have built four cycles for years and after elaborate experiments decided to abandon that type in favor of the two-cycle. It might seem that it is to simplify the engine and make it more readily reversible, that in part is one reason, but Sulzer uses that type for engines of the stationary design also.

Can it be to avoid valves exposed to high temperatures? It would seem not, as all outside of Sulzer still use inlet valves in the head while Sulzer gets along with starting valves in the head and uses inlet and exhaust ports in the cylinder bore preferring to consider the least of two evils, and get an ideal combustion chamber.

A prominent authority says, "To obtain maximum mean effective pressure per revolution the two-cycle must be adopted." He might also have added to obtain maximum horsepower for a given weight and space.

This is an essential in a boat where space and weight is a factor in gross weight receipts. In the automobile, however, there is a desire to develop engines that are heavy and reduce weight by the use of aluminum and pressed steel parts instead of the more logical method of developing engines to produce the same number of impulses with one-half of the parts regardless of any fashion which in other lines changes with the season.

What special objection is there to an engine that has an ideal combustion chamber, no valves exposed to heat, cylinder air scavenged, piston air and charge internally cooled, and will deliver the same number of impulses with 1-2 the number of parts?

Cleveland, Ohio. SUBSCRIBER.

Firing Order of Cadillac Eight

Editor THE AUTOMOBILE:—Will you please explain the firing order used on the eight-cylinder Cadillac?

St. Louis. Mo. A. L. D.

—The firing of the eight-cylinder Cadillac, considering that the motor is made up of two sets of fours each being numbered 1, 2, 3 and 4; beginning at the front and counting towards the rear, is as follows:

Number 1, right—number 4, left—number 3, right—number 2, left—number 4, right—number 1, left—number 2, right—number 3, left.

This may be simply shown by the arrangement below:

Front of —	Right	1	3	4	2	Rear — of
Motor	Left	4	2	1	3	Motor

Each diagonal pair adds up to five and this is why this particular firing order is selected as it gives evenly distributed firing impulses about the mass center of the motor.

Differential Locks Cannot Be Attached

Editor THE AUTOMOBILE:—Can differential locks be applied to a touring car? If so, please tell me where they can be procured?

Wasta, S. Dak. A. MATHIAS.

—No. Provision must be made for the differential lock when the axle is designed. Obviously it would be a difficult matter to install a device on an axle already built which would lock the two axle members together and cause them to rotate as one.

A typical differential lock is shown in Fig. 1, where it

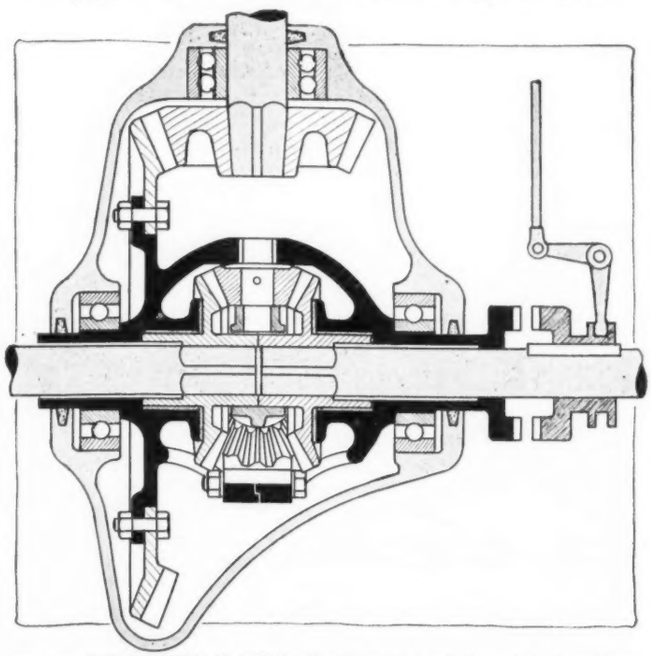


Fig. 1—Differential lock which allows the wheels to rotate together

will be noted that the dog clutch at the right locks the shaft on this side to the differential gear housing and since these two must then revolve together differential action is stopped and the other shaft must move with them.

Claims Water Will Remove Carbon

Editor THE AUTOMOBILE:—In answer to inquiry of M. Chase of Portland, Me., in your issue for November 5, as to whether water will remove carbon by dropping it into the carbureter, will say that I have been using water for removing carbon in my Hudson car for the past 2 years not by dropping but pouring it into the carbureter, a 1-8 to 1-4-inch stream being used.

My method is to open the cut-out, start the engine, allowing it to attain a fairly good speed, and pour water in the air intake, using a .5-gallon oil can with a spout so that it can be handled with one hand. Don't be afraid to pour in the water; you will be surprised to see the power that is generated through the steam that is formed together.

If you have a bad case of carbon use a 5-gallon can and set it at a convenient place near the carbureter, Fig. 2, and use a rubber tube to lead the water into the carbureter, using a stop cock to control the flow. Then start the engine as above stated and let it run for 3 or 4 hours, when you will find the carbon in little chunks back of the exhaust and there will be carbon mud in the base of the engine. After two or three treatments like this you will probably find a quart or more of carbon mud in the base of the engine. It would be a good plan to give this treatment every 1,000 miles.

Daytona, Florida. D. D. ROGERS.

Water a Good Carbon Remover

Editor THE AUTOMOBILE:—In your last issue is an inquiry from a Mr. Chase asking about the use of water through carbureter for cleaning cylinders.

I have a Marmon-32, 1910—Model F. Schebler carbureter and I have tried this with success. I let the engine run until warmed up, then drop rain water into carbureter slowly enough so as not to choke the engine. I put a pitcher full through. I formerly used kerosene, and with water a smoke is emitted similar to kerosene. The engine worked much better, stopped knocking and had improved power considerably.

This method of removing the carbon is so cheap that one is suspicious, but it has done well for me.

Warren, Ohio. T. G. DUNHAM.

Cantilever Spring Much Heavier

Editor THE AUTOMOBILE:—Several friends of mine have had discussions as to the relative strength of semi-elliptic and cantilever springs to carry the same weight. From the reactions, it seems to me that the cantilever spring must be just twice as heavy as the semi-elliptic, the other parts of the car being identical.

Oradell, N. J. A. M. WHITING.

—The cantilever spring is nearly twice as heavy as the half-elliptic. According to the simple beam theory it should need to be twice as strong, but in practice it is found that it is not necessary to make it quite as strong as this.

Here are the opinions of the engineers of some companies which are using this type of spring on the advantages of this spring and its comparative weight.

According to T. P. Chase of the King Motor Car Co., this extra weight is an advantage. He goes on to say, "Springs which we use are considerable shorter and very much wider and thicker than a semi-elliptic spring would be. Our spring is 2 1-2 inches wide and has nine leaves, whereas the semi-elliptic to carry the same load would be about 2 inches wide and have only 8 leaves.

The load carried on the rear axle is applied at the small end of the cantilever spring and when the spring is considered as a beam, the load at the center of the spring or at the point of attachment to the frame, is very much more than the load on the rear axle and the movement of the spring at this point is considerably less for a given amount of movement of the axle. In the semi-elliptic spring the reverse is true. The load on the axle is applied at the center of the spring and any movement of the axle caused by an obstruction is more at the end of the springs. The cantilever spring also has, what may be termed, a quicker periodicity of movement and the movement of the axle affects the lesser movement of the body for these reasons."

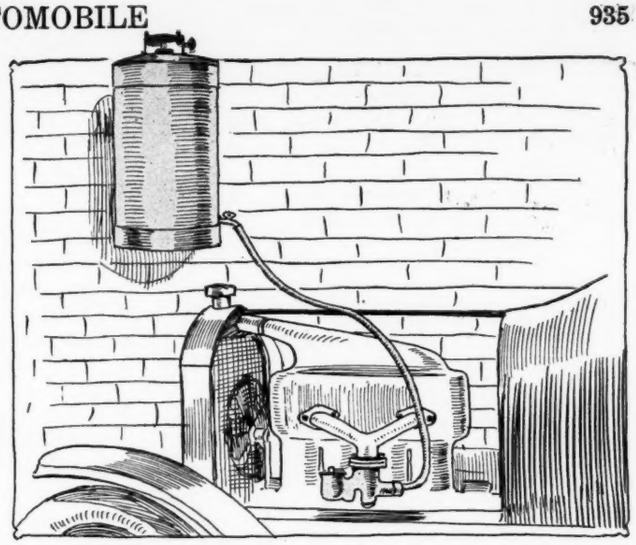


Fig. 2—Diagram showing how water is fed to carbureter by gravity

D. B. Webster, Assistant Mechanical Engineer of the National Motor Vehicle Co., states that, "Our experiments show that there is less rebound and side sway with cantilever springs than with the regular three-quarter elliptic. We are not able to give you any figures on this, but our impression is gained from riding in the same car equipped first with three-quarter elliptic and then with cantilevers.

"We also consider it an advantage that the cantilever spring brings the heavy strain further forward on the frame where the section is better able to carry it.

"Our experience shows that we need a stronger spring in about the proportion called for by theory."

H. J. Edwards, Engineer for the Garford Co., maker of the Willys-Knight says: "Both the fixed cantilever spring and the floating cantilever spring such as used on the Willys-Knight cars have to be of heavier section than a similar semi-elliptic spring under same load conditions.

"The fiber stress or the bending moment on the center section of the cantilever spring is without doubt double that of a similar semi-elliptic spring, as is shown by the beam theory. Cantilever springs, therefore, are of a greater section than the semi-elliptic springs. The reason why it does not have to be twice the section is that the spring does not receive the hard service and extreme flexure of the semi-elliptic. In a car with 8 inch clearance the semi-elliptic spring must be bent 8 inches while the cantilever type of spring would be deflected only 4 inches. The spring works within small limits of fibre stress and the allowable working stress in the leaves is correspondingly higher. A cantilever spring 56 inches long is equivalent in riding and springing qualities of a semi-elliptic spring 112 inches long.

"The saving in unsprung weight which is approximately the weight of the semi-elliptic spring adds also to these other advantages and is probably much underrated."

Four by Five Motor for 2,800-Pound Car

Editor THE AUTOMOBILE:—I am rebuilding an E. M. F. car. It will have a full-floating axle with 36 by 4 wheels.

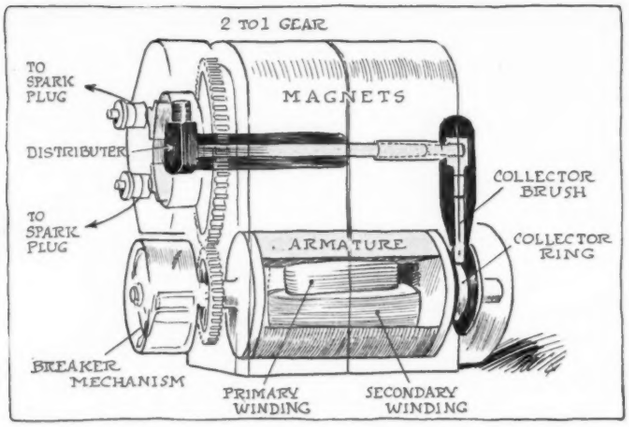


Fig. 3—Phantom side elevation of high-tension magneto

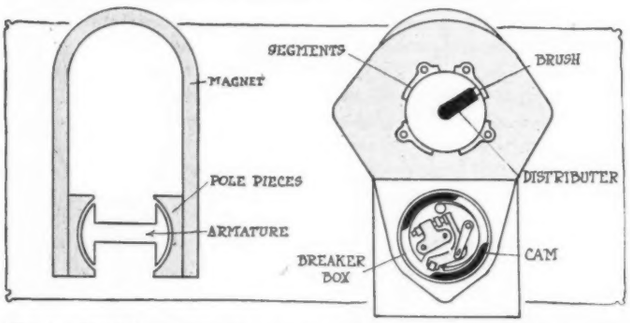


Fig. 4—Position of armature and breaker just before points separate. The armature is rotating in an anti-clockwise direction

Do you think a unit power plant with 4 by 5-inch high-speed motor will give sufficient power with these wheels geared 4 to 1? I estimate the car to weigh about 2,800 exclusive of passengers when complete.

2—If these wheels are too large what size would you suggest, 34 by 4 or 32 by 4?

Broken Arrow, Okla. DR. J. H. LAWS.

—1—This motor should develop sufficient power to make this machine speedy and an excellent hill-climber.

2—The wheels are not too large for the gear selected. Tires of this diameter also have the advantage that they will wear longer and be easier riding due to the fact that the larger the diameter the less the wheels sink into holes.

How To Wire Ford Headlights

Editor THE AUTOMOBILE:—According to your advice to J. M. Harper which appeared in the October 15 issue of THE AUTOMOBILE, on page 714, regarding the wiring of a storage battery and magneto to the headlights would you not obtain only 6 volts when the battery was switched on and 12 volts with the magneto in operation?

In this country I have never seen Ford headlights wired in parallel but always in series with 6-volt bulbs. If your correspondent has his lamps wired in parallel I can quite understand the motor stopping when he switches the lamps on.

Croyden, Surrey. F. V. MILNE.

—In our answer to J. M. Harper's letter nothing was said about voltage and therefore it was taken for granted that the battery furnished 12 volts the same as the magneto and that the lamps were also of 12 volts. Therefore the wiring diagram which we suggested and which is shown in Fig. 5 is correct. There is no reason why 12 volt lamps may not be used successfully, although the 6-volt type may be more common.

If a 6-volt battery were used in this diagram, however, the motor would not operate on the magneto, just as you suggest; because the storage battery would then act as a short circuit.

In order to use a 6-volt battery the lamps must be 6-volt and be connected in parallel on the battery and in series when on the magneto, as is indicated in Fig. 6.

Two double throw switches are used, wired as shown. The handles of the two switches must be connected together so that when one moves to the right or left the other does also. If this connection were not made there would be danger of throwing one of the switches the wrong way.

Seven-Passenger Body for a Five

Editor THE AUTOMOBILE:—1—I would like to replace my five-passenger body with a seven. Do you think the extra overhang on the rear axle would hurt the motor?

2—If a motor is equipped with a high-tension magneto, does each cylinder receive alternately one effective spark and one surplus spark?

New York City. L. J. H.

—1—The extra load will not harm the motor, if it is not allowed to labor on high gear. When it is evident that the car cannot climb a certain hill on high gear, rather than force it up, a shift to second should be made. The same applies when running on second gear and low gear is required. There is more danger of hurting the springs or wearing out the tires. Possibly it will be necessary to substitute stiffer springs. Unless the tires are amply large for the weight they are now carrying, oversizes should be put on, at least on the rear where the greater load is.

2—The ordinary four-cylinder, high-tension magneto only produces sparks when required, that is, at the beginning of the working stroke. Such a magneto produces a spark every half revolution of the armature and therefore by connecting it to the motor so that it revolves at the same speed, just the right number of sparks are generated, since a four-cylinder, four-cycle motor requires a spark every half revolution. These sparks are distributed to the proper cylinders in turn by means of a rotating brush.

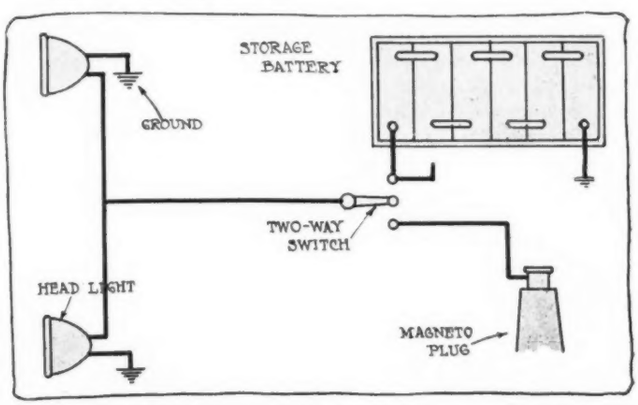


Fig. 5—Ford wiring diagram with 12-volt battery and 12-volt lamps

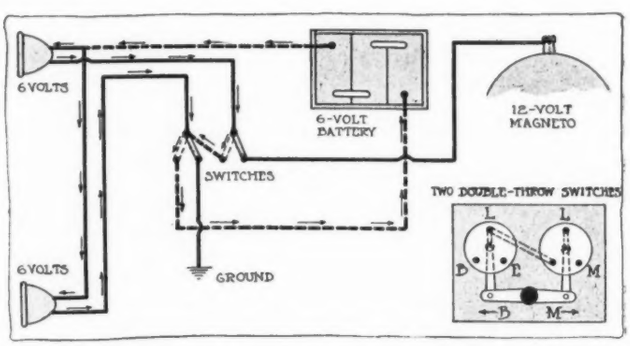


Fig. 6—Ford wiring diagram using 6-volt battery and lamps

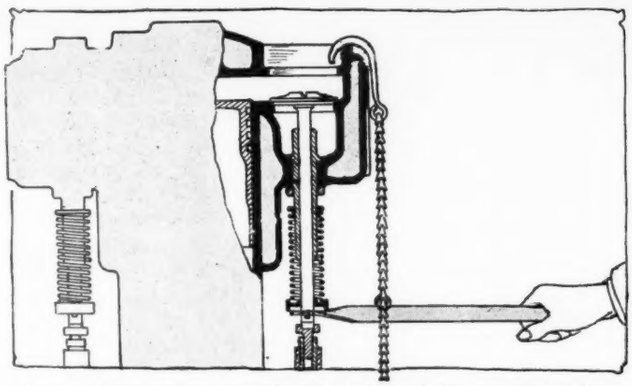


Fig. 7—Pierce motor, showing method of lifting valve spring to remove key holding spring seat

The complete mechanism is shown in Figs. 3 and 4.

The current is generated in the armature which consists of a few coils of wire in the slots of the H-shaped core. The armature core is made of iron and lies between the ends of the large magnets which give the instrument its name. Whenever the armature is in the position shown in the figure a maximum current is being generated in it due to the fact that it is moving, with greatest rapidity, through the magnetic lines of force passing between the iron pole pieces. When the armature is at right angles to this position, the wires of the coil are entirely out of this influence and no current is generated.

With the armature in about the position indicated, the spark is produced when the circuit is broken by the separation of the breaker points. When these points fly apart; impelled by the cam shown, the current dies down in this circuit. This causes a high voltage to be generated in the secondary circuit. The latter has no electrical connection with the former, but is magnetically linked. The primary coil which forms part of the primary circuit is inside the secondary coil which forms part of the secondary circuit. In the magneto shown, the primary coil and the armature winding are one, the secondary coil is directly outside of it and all rotate together.

The current is distributed to the proper cylinder by means of the rotating brush which makes consecutive contact with the four segments which are connected to the high tension wires running to each of the four cylinders. The distributer runs at half the speed of the armature and the two are positively connected by gears. The two are so set that the brush is in contact with one of the segments when the breaker points separate and the spark occurs.

How To Grind Pierce Valves

Editor THE AUTOMOBILE:—1—I have a Pierce-Arrow car and would like to know the best method of grinding the valves.

2.—How should I prime the motor.

Baltimore, Md. JOHN E. BROOKS.

—1.—First remove the valves which require grinding. The ones which probably need grinding are those which do not hold the compression. The compression of each cylinder may be tested by opening the priming cocks on all the cylinders, but this one and noting whether an increasing resistance to cranking is felt as the piston of this cylinder progresses upward on the compression stroke. If not, compression is leaking and the most likely place is past the exhaust valve although the inlet valve may be at fault or possibly there is a leak past the rings.

Having determined those exhaust valves that probably require grinding, the next step is to remove these valves. The valve caps are unscrewed, and then by the aid of a valve spring lifter as shown in Fig. 7 the key holding the spring seat of each valve in place is removed. This is done by installing the valve spring lifter as shown, then by pressing down on the handle the spring seat is raised and the key may be withdrawn with the other hand. It will be easier to do this when the valve is seated, as the spring is fully expanded then and is therefore easier to compress.

The removal of the valve is next. Start it upward by inserting a screw driver between the valve stem and the valve tappet, or else turn the motor over until the valve is fully opened. After the valve is raised off of its seat by either of these methods it may be withdrawn by slipping a piece of string around the head.

Withdraw the valve spring by grasping it firmly with both hands and working it out over the push rod.

You are now ready to begin the grinding operation. Coarse and fine emery powder mixed with enough cylinder oil to form a thin paste may be used as a grinding material or a suitable grinding paste may be procured from any supply dealer.

Apply a small amount of the coarse variety to the seat of the valve, replace it in the motor and using a screw driver rotate the valve back and forth through a small angle several times. Raise the valve from the seat, give it a quarter turn, and then repeat the operation. The valve may be raised by hand or a weak coil spring may be placed under the head so that the moment the pressure of the screw driver is removed the valve flies up.

The object of the grinding is to remove pits in the valve and its seat as shown in Fig. 8. After these have been ground out, the surfaces should be polished by using fine emery or paste. Be careful not to get any of the grinding substance on the stem of the valve for it will wear the guide.

When the grinding is finished, the surfaces must be carefully wiped clean so that every vestige of the abrasive has been removed and then the valve mechanism should be reassembled.

Then clearance between the valve stem and the push rod must be readjusted. The clearance should be sufficient to allow the insertion of a sheet of writing paper. This adjustment is made by turning the screw in the top of the push rod to the right or the left, as the case may be, after the lock nut directly below it has been loosened.

2—Unless you use a special priming device the best way to prime the motor is to inject a small amount of gasoline into each cylinder through the priming cups. A teaspoonful for each one should be enough.

Buick C-25 Sells for $950

It was stated in the October 15 issue on page 715 that the price of the Buick model C-25 for 1915 was $1,050. This should have been $950.

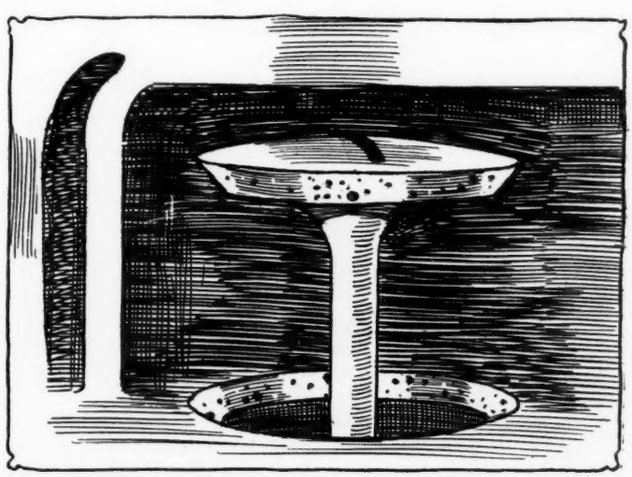


Fig. 8—Pits in valve and seat which cause loss of compression

American Motor Vehicles for the Belligerents

With Special Reference to 1915 Needs of Russia

OFFICIALLY Russia is no longer in the market for American motor trucks or automobiles, having bought all wanted for the present. It is desired to gather some experience first with these vehicles of different manufacture before formulating requirements for further needs, as their suitability for the local conditions cannot be ascertained for some time to come. It is considered very unlikely that it should prove possible to utilize motor trucks to advantage during winter and spring on the poor roads of Galicia, Poland and East Prussia. No adventurous propositions are entertained, as no emergency is recognized. Russia's Commissioner, Baron de Korff, and the military attaché, Colonel Golejevsky, warrant no information of more detailed nature.

Unofficially, the case stands differently. All are at liberty to theorize about Russia's wants and to strive at anticipating them, and it will be desirable for all concerned if any action taken, on this basis, for supplying the wants of the future happens to fall in line with the instructions which the Russian purchasing agents eventually will receive from their government. Communications on the subject will naturally be placed on file in the meantime.

The field is thus open for speculation, and as war time is notoriously liable to sudden changes of conditions, some of the elements upon which a considerable amount of business may depend command a timely and actual interest.

The inaccessibility of Russian ports during the winter almost closes the empire against immediate deliveries. Archangel, the port on the Arctic ocean which is reached by passing north of Norway and Sweden, can probably not be kept open much longer, even with icebreakers. The energetic use of ice-breaking vessels is under consideration, however. Petrograd (St. Petersburg) can receive goods only at great risk so long as Germany controls the Baltic and the precarious definition of contraband makes it difficult to ship through Norway and Sweden.

Odessa on the Black Sea is an inland city unless means are found to pry open the Dardanelles and the Bosphorus for the passage of war supplies. There remain Vladivostok and Port Arthur. The latter is ice-free and under Japanese control. Only in a great emergency could it be contemplated to ship motor vehicles, even unassembled, from American manufacturing centers to San Francisco, thence over the Pacific Ocean to Port Arthur and from Port Arthur over 7,000 miles of Manchurian and Siberian railway to Petrograd. These conditions alone would dictate a waiting policy with regard to the ordering of motor vehicles for the present, but a change in the relations of Turkey and the Balkan states to the war might open Odessa, (a chance much enhanced by Turkey's actual entry in the warfare, which took place shortly after these notes were written), while one affecting Denmark or Sweden or both these countries might open or close the northern route definitely, even after the breaking up of the ice, next year.

From the reports of the war in Belgium and France it seems clear that motor trucks are principally used for the commissary department and for the transportation of ammunition and rapid-fire guns; to some extent also for the hauling of field ordnance, but the trucks used for the latter purpose are mainly of the four-wheel-drive type, which cannot yet be made in large numbers in the United States. The lighter types of vehicles and especially ordinary automobiles in all sizes are employed on a large scale to expedite the movements of troops, not only for getting them from the rear to the front but in ever increasing measure also for effecting tactical changes along the much extended firing lines. In many instances trucks and omnibuses have served to rush troops forward and have afterwards doubled on their tracks to fetch more ammunition and food from the rear. On account of the long battle formations there has been no real rear guard in this war but only strings of detachments for protecting the lines of communication, the railways and the roads, the bridges and culverts.

While it is unlikely that Russia has contemplated the extensive use of ordinary automobiles for the purpose of gaining strategic advantages through a great rapidity in the movement of soldiers or for saving them from fatigue, there is no doubt that her generals have been at a disadvantage in this respect and that motor vehicles would be so used, if they could be had. But staff officers, aides and couriers have absorbed the supply of automobiles on hand. The winter campaign must be fought without more extensive use of them, but Russia is fortunate in being able to put two men in one place rather than one man in two places and thereby make up to some extent for her shortcomings in this feature of transportation equipment. The massing of enormous numbers will do for defense, but for offensive operations a high degree of mobility is required, and if the lessons in latter-day warfare taught so far are accepted it can therefore be taken for granted that Russia, if she can hold her own, will want just as many automobiles and trucks in the spring as she can get.

All Sizes Needed

The question of their weight and capacity is paramount and intimately connected with the road conditions. The German and French view, greatly favoring the large unit—very substantial, large and heavy, yet limited to an axle load of about 6,000 kilograms maximum—seems still to be shared in Russian official circles, and it is in accordance herewith when military representatives place great emphasis on the avoidance of skidding, which is far more serious for heavy than for light vehicles, but the lessons of the present war on Belgian and French soil do not go in the same direction except where the traction of heavy ordnance is involved. On the bad roads of the eastern country the light vehicles will necessarily prove even more indispensable for mobility than they have proved in the summer season on the western arena whenever macadamized roads had to be left behind. The saving in drivers' wages which operates so strongly in commerce to keep the capacity of vehicles up to the largest which the roads will support, is of course entirely eliminated. In the military operations drivers can be had in plenty and a sufficient number of men is always on hand to help a vehicle out of any temporary predicament to which it may become subject or to ease it over an impassable piece of territory, provided the vehicle can make up for the trouble by the speed it makes possible under average conditions.

It is apparently not quite the correct idea that the 1 1-2 ton truck is coming into demand for these reasons in preference to the 3-ton and the 5-ton trucks. The lighter type of truck is still too heavy for meadows and wet ploughfields, and for good roads the heavier truck is preferred, but in Russia the light truck will no doubt be demanded for all transportation work among the reserve forces and most when fitted with a stake platform which affords handholds for soldiers and can be readily adapted to many different purposes. Nearer to the battle formations, however, all results point now to the additional need of much smaller units; to the great superiority of five or six chassis rigged up to carry from 1-2 to 1 ton, each, of either dead or live load in any helter-skelter manner as compared with a corresponding load capacity in the form of one or two 3-ton or 5-ton vehicles—especially as the latter have plenty of work elsewhere. Such chassis, which can be turned out in great quantity in this country on short notice, have the most advantageous contact area of the wheels with the ground, to secure traction, and can be helped out of a diffi-

cult spot in a jiffy by its occupants, while the more numerous occupants of a heavier vehicle cannot find spots enough for applying a boost proportioned to its weight.

An Austrian lieutenant acting as despatch bearer in the Galician and Polish campaign relates how his little car, of the Wanderer model, proved to be the only one of all the motor vehicles of the army corps which remained in commission in the broad zone of forests and bogs at the Galician frontier. Writing on September 16 he relates: "After the first three weeks I had learned to be glad when I was only required to drive through a potato field. Morasses, quicksand, forest bottom with tree stumps, roads with an endless succession of holes in which the wheels sank to the hubs, now on the right side and now on the left, and again on both sides at the same time, made it impossible for days on end to change from the low to even only the second speed." Finally a Russian shell demolished the car after five weeks of service. (From October 10 issue of *Allgemeine Automobil-Zeitung*.)

It is plain that the theories relating to military motor vehicle service which had been formed on the basis of antebellum maneuvers have been profoundly changed and widened through the actual war tactics, in which the protection of the artillery against flank attacks plays an enormously important part, necessitating a new sort of mobility parallel with the lines of intrenchment extending for hundreds of miles, nearly at right angles with the direction of advancement or retreat.

Only automobiles, in the smallest possible units, and bicycles render this mobility practicable, while the use of the same class of light vehicles for the general transportation work of the armies is scarcely secondary to that of the larger motor vehicle units and the railways. The whole military motor vehicle field is suddenly found to have been greatly extended.

To the American automobile industry this condition, which has barely reached official notice as yet or been fully appreciated in its practical consequences, may soon result in extraordinary activity, as no other country can produce small motor vehicle units with anything approaching the rapidity of production which can here be realized. But it stands to reason, perhaps, that the runabout chassis which may be demanded in large numbers, at almost any time from now on, should be protected against the severities of the service to which they may be exposed. Probably the springs should be strengthened and lengthened (so as to retain all their flexibility) and provided with rebound checks. Probably simple platforms should be provided instead of the ordinary bodies. Perhaps the tires should be solid and anti-skidding.

The possibilities for shipping the vehicle parts unassembled, with an assembling crew to put them together at their destination, also form an interesting subject for speculation on which the foreign purchasing agents may be able to give pointers as soon as their governments are ready.

A boom in second-hand vehicles is not excluded. If the demand should come with the suddenness and insistence that is foreshadowed by the events, an organization able to place thousands of inspected and classified small motor vehicles at disposal on short order would be entitled to a hearing.

As an example of the conditions in Russia which should make the use of motor vehicles of almost any description highly desirable, it may be mentioned that nearly all of the Russian railways have tracks which are 3 1-2 inches wider than those of the Prussian and Austrian railways with which they connect, so that unloading and reloading are required at the frontiers, and that even such towns in Russian Poland as Lomsha, with 22,000 inhabitants, and Pultusk, with 16,000 inhabitants, have no railway facilities whatever. With regard to the transportation of troops and military materials, the Russian preparations have been for a defensive and not for an aggressive campaign.—M. C. K.

British Army Truck Efficiency

By J. M. C. Rowley

HAVING referred in last week's issue to the German armored cars which I saw at Ostend, I should add that their capture from the enemy may have been due to the poor protection they afford the driver against a flanking fire. They are, however, quite formidable looking and dash about through quiet villages, their three great headlights terrorizing the inhabitants. The radiators did not seem to be protected in any way, but there is a powerful buffer to protect them from impact. One or two radiators were perforated by bullets, although I could not get near enough to trace the passage of the bullet and find whether it had vitally affected the motor. One thing was plain. An armored car of the German description is very easy to make from an ordinary touring body. In British service several Ford cars are being fitted with ambulance bodies and they are doing excellent work in this connection.

I have just met some motor transport drivers and learned many interesting facts regarding the work of motor transports. Motor transportation back of the firing line is exceedingly well organized, the vehicles supplying the troops with food, clothing and ammunition. The constant supply of the latter to the artillery corps insures the incessant continuance of artillery attacks which has characterized the present war.

Formerly the connection of a long line of troops was made by railroad, but today the motor bus enables the whole army, soldiers and transport, to move together as a unit. The railroad is not by any means dispensed with, and so far as it goes, is used for the transportation of all kinds of material and supplies. In the present campaign, the railroad, however, is not the governing factor in the movement of troops. The supplies are removed from the trains to the 3-ton motor wagons, and these follow the troops wherever they go. In this way the army is kept constantly supplied with rations, the soldiers having 2 days' food supply, and the trucks carrying supplies for 2 days more. All the movements of the trucks are in strict accordance with schedule arranged by the army service corps. The motor trucks meet the trains and the motors are in turn met by the horse wagons, which convey the supplies direct to the firing zone.

In conversation with one driver who had been several times in the fighting zone with his motor truck, he said: "I carried ammunition and distributed it to the artillery corps, ranged on a slighter elevation over against the German trenches and earthworks. Practically all the time my truck was under fire, but the marksmanship was poor and although one or two stray bullets and pieces of shell hit the truck the steel plates were not damaged. I passed through safely and returned to the point from where I started by another route away behind the firing line." The truck driven was a regular war-office machine painted gray and with stout metal defenses around the whole motor and body. The ordinary motor suffers a great deal under fire if it is not protected in any way. I have seen huge masses of débris, wheels, smashed bodies, crushed motors, bent axles, etc., along the roads over which I passed. It seems that in many cases motors have been purposely destroyed. A truck perhaps forming one of a long convoy goes wrong, and the enemy is close behind. There is no time to repair the trouble and rather than allow the machine to fall into the hands of the foe it is destroyed as quickly and as thoroughly as possible.

Perhaps this will be known in history as the great motor power war.

Zenith Tests on Dynamometer Set

Complete Laboratory Equipment Devoted to Carbureter Trials

THE newly equipped testing laboratory of the Zenith Carbureter Co., Detroit, Mich., is located in one end of the new plant, and includes a complete Diehl electric dynamometer outfit. This apparatus is very similar in principle to the A. C. A. testing apparatus in New York, and could be used for just as accurate and exhaustive testing.

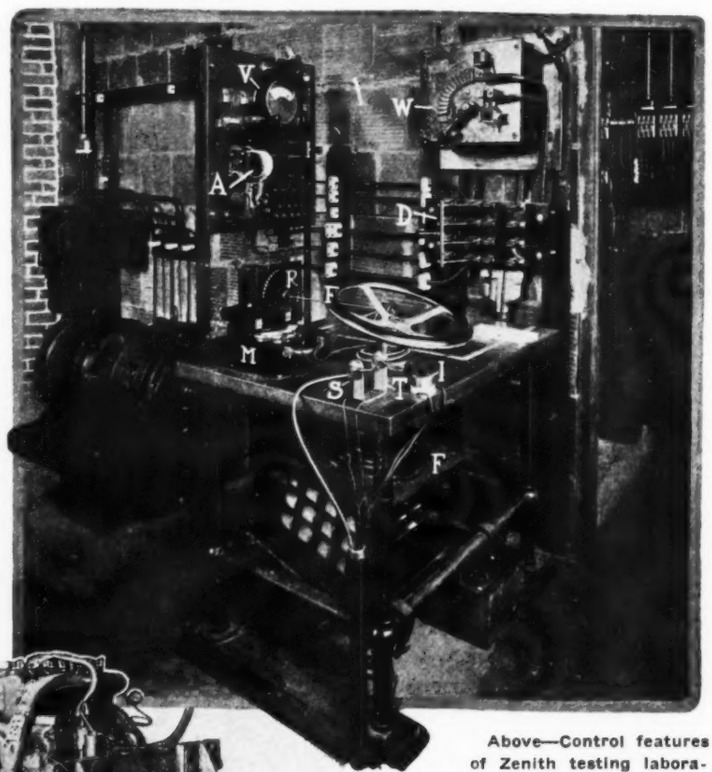
Of course, for carbureter testing, such an equipment acts only indirectly, in that the dynamometer records the power output of the gasoline engine to which it is connected, and its power output is in turn dependent to a large extent upon the carbureter furnishing it with fuel.

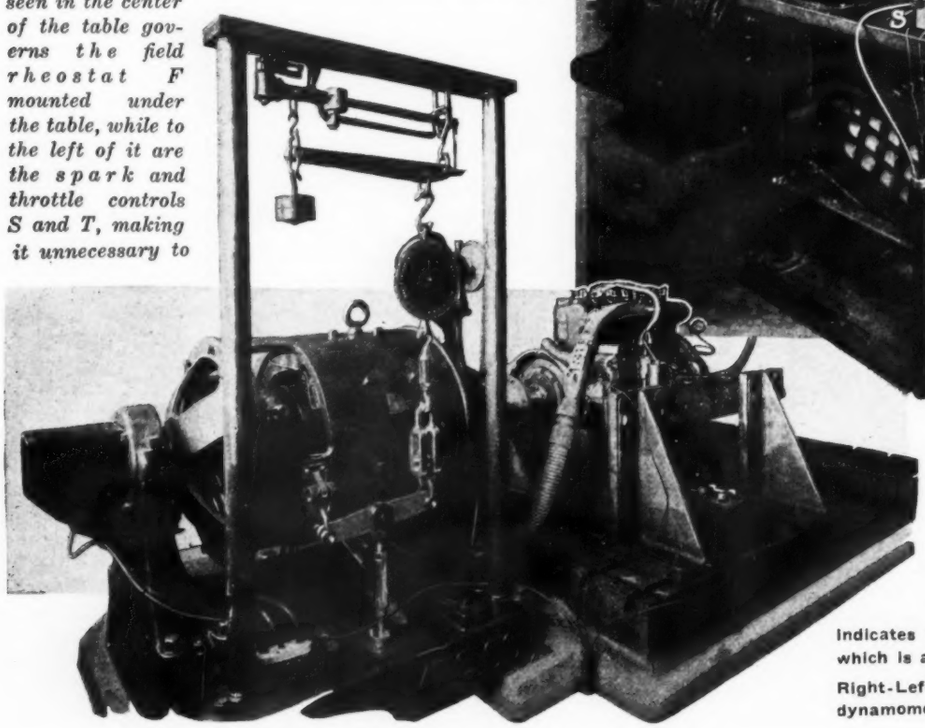
The gasoline engine connects directly to the armature of the electric dynamometer, and when the latter is driven by the engine, the armature tends to revolve the field, or outer part of the electric machine along with it due to the magnetic attraction between the two parts. The field portion is free to turn on its bearings at either end, and it is separately excited by the current from a transformer set which is a part of the equipment because the dynamometer requires direct current whereas the city supply is alternating. But the field of the dynamometer is attached by a link connection to scales, and the force necessary to prevent its revolving with the armature is thus measured by the scales, and is an indication of the power being put into the machine by the gasoline motor, the force, speed and so on being taken into consideration in figuring the horsepower by formula.

In one of the illustrations is shown the grouping of the various controlling and indicating apparatus on the table and on the wall and switchboard to the right and in front of the table. The hand wheel F seen in the center of the table governs the field rheostat F mounted under the table, while to the left of it are the spark and throttle controls S and T, making it unnecessary to step over to the motor to regulate them. Just in front of the wheel is a switch I which may be used to shut off the ignition current. An electric tachometer M records the dynamometer speed.

Without moving his position, the operator may also regulate the supply of cooling water to the engine, while at his right is the main double-throw switch D which, in one position, sends current into the armature of the electric machine so that it may be operated temporarily as a motor for starting the gasoline engine, while in the other position it loads the armature by sending the generated current into the resistance coils, the machine then acting as a dynamometer. Above this is the starting switch W for starting the dynamometer as a motor after the main switch is thrown in.

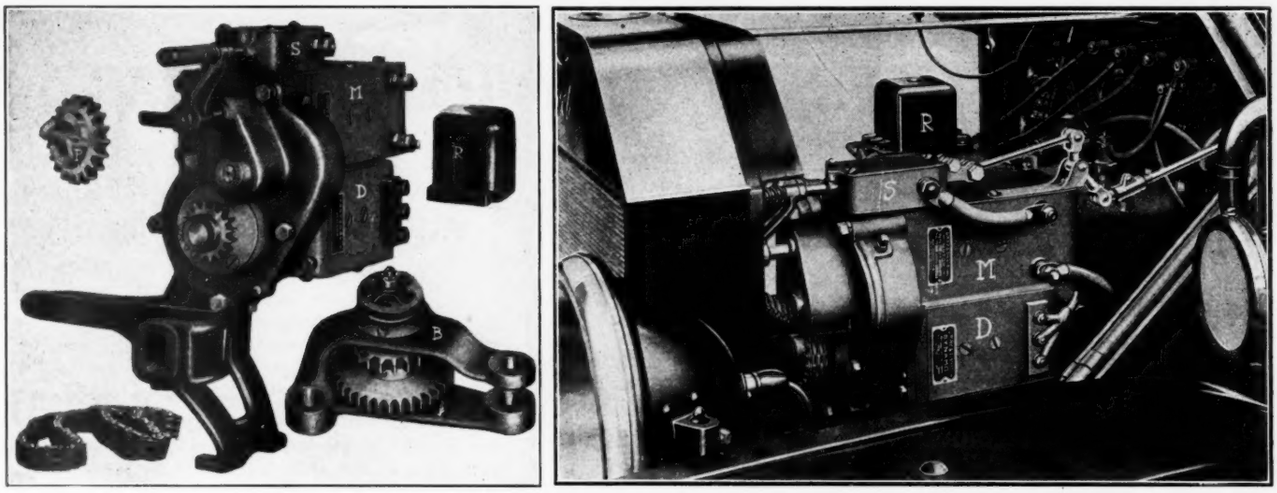
On the switchboard is a rheostat R for adjusting the transformer set voltage. The board also carries the voltmeter V, dynamometer circuit breaker A, etc.





Above—Control features of Zenith testing laboratory. A, automatic switch which cuts in when double throw switch D is swung to dynamometer position. F is the field rheostat and the wheel F is hand control for same. W is the switch starting the dynamometer as a motor. S and T are spark and throttle controls. I is the ignition switch, M the tachometer and V indicates the voltage of the transformer set, which is adjusted by rheostat R.

Right-Left—Motor mounted for testing by Diehl dynamometer in Zenith carbureter plant.



Gray & Davis starting and lighting system for Fords. Right—System mounted on Ford. Left—Details of system. R is regulator, P the driving sprocket, B the bracket, M the motor, S the switch and D the dynamo

Gray & Davis Ford System

Two Units in One Case —Drive by Silent Chains —6 Volt, Single Wire

A COMPLETE starting and lighting system for Ford cars has been brought out by Gray & Davis, Inc., Boston, Mass., as was announced briefly in the Nov. 5 issue of THE AUTOMOBILE on page 872. The complete outfit, including starting motor generator, battery and wiring sells for $110. The system is a 6-volt, single wire type, and the starting motor and electric generator are distinct units, although mounted in one casing, the motor being placed above the generator. The whole device is very compact, the regulator and switch being carried on the top of the main unit. Connection to the crankshaft is made by silent chains. By pressing the starter pedal or button the switch is closed and the motor is cranked at a speed of 75 to 100 revolutions per minute depending on the condition of the motor, the viscosity of the oil, the temperature, etc.

Voltage regulation of the generator is accomplished by means of inserting resistance in the field circuit as the speed increases. This is done by means of a solenoid which operates on two resistance coils, the one being brought into circuit at medium speeds and both being switched on at high speeds.

60 Ampere Hour Battery

The storage battery is a 6-volt, 60-ampere hour of Willard make. It is charged by the generator at speeds above 12 miles per hour. Below this speed the cutout regulator automatically breaks the circuit, thus preventing the battery discharging. Below this speed the generated voltage is less than the battery voltage and therefore current would flow from the battery through the generator windings, operating it as a motor if the circuit were not broken by the cutout.

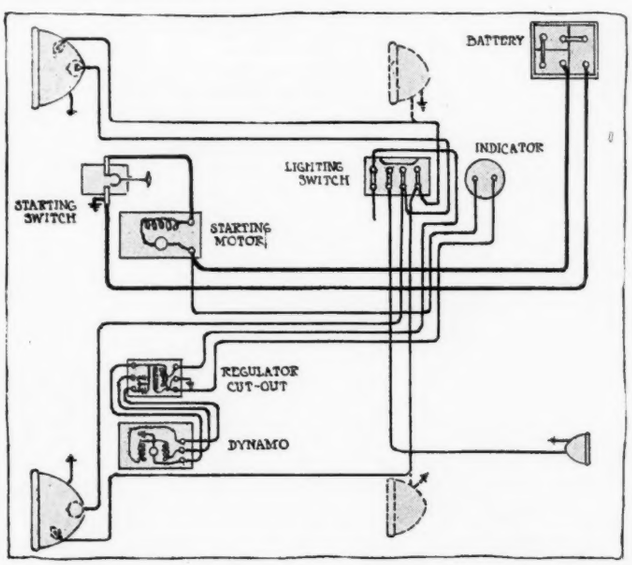
To go with this system the company has brought out a set of headlights which sells for $11 per pair and a tail light which retails at $2. The headlights give 15 candlepower while the tail light is equipped with a 2-candlepower bulb.

The attachment of the system requires little or no fitting, and the removal of very few parts. The radiator, the fan and bracket, the starting crank and the fan driving pulley are the main members that must be removed.

Then the driving sprocket is mounted on the crankshaft and the starting crank attached. The first and third cylinder head bolts are taken off and the raised part of the casting is chipped to the level of the machined surface of the hole to provide a seat for the upper bracket support. The third and fifth crankcase bolts are taken out and a place is similarly made of for the lower bracket support. The starting and lighting units are then put in place.

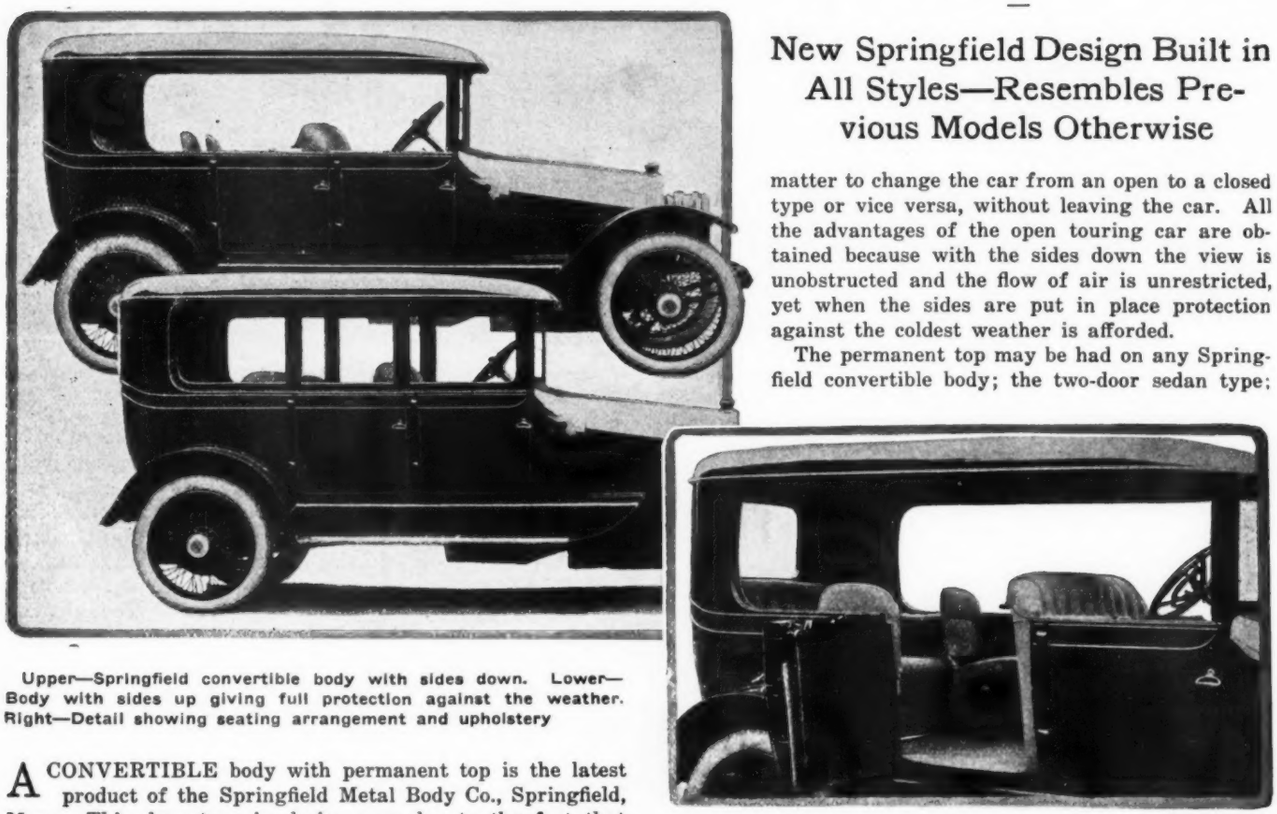
The horizontal chain may be adjusted by turning an eccentric bushing at the left side of the sprocket holder, while the vertical chain may be taken up by turning the adjusting screw on the under side of the bracket.

In the diagram herewith the wiring of the starting circuit is indicated by the heavy black lines. This part of the circuit is of the double-wire type, but the remainder of the system which comprises all the lighting circuits is wired singly, the return connection being through the frame. When the dynamo is in operation current flows from it to lighting switch and from thence to the lamps but when it is not, the cutout regulator breaks the circuit, and current is furnished by the battery.



Wiring diagram of new Gray & Davis Ford system

Convertible Body with Permanent Top



Upper—Springfield convertible body with sides down. Lower—Body with sides up giving full protection against the weather. Right—Detail showing seating arrangement and upholstery

New Springfield Design Built in All Styles—Resembles Previous Models Otherwise

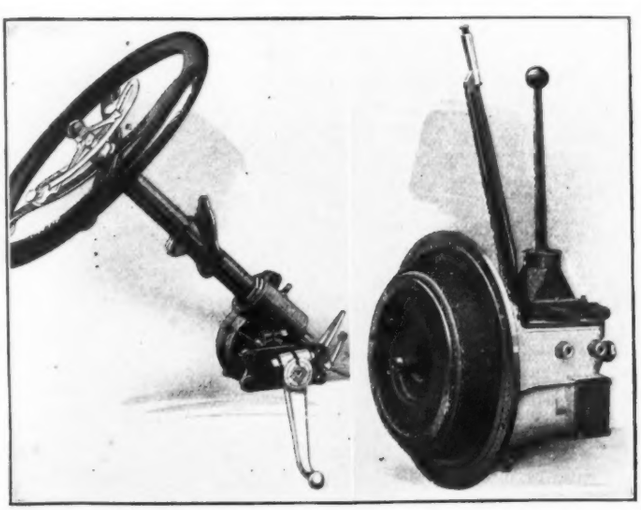
A CONVERTIBLE body with permanent top is the latest product of the Springfield Metal Body Co., Springfield, Mass. This departure in design was due to the fact that there are a great many people owning convertible bodies and open touring cars who never lower their tops. To these people this new design will appeal as it obviates the trouble of raising or lowering the top. The top, since it is permanent, provides a strong support for the sides, and it is a simple matter to change the car from an open to a closed type or vice versa, without leaving the car. All the advantages of the open touring car are obtained because with the sides down the view is unobstructed and the flow of air is unrestricted, yet when the sides are put in place protection against the coldest weather is afforded.

The permanent top may be had on any Springfield convertible body; the two-door sedan type; four-door; five-passenger, and the four-door six or seven-passenger. The list prices of these bodies, mounted, are: $975 for the two-door sedan type; $1,400 for the four-door five-passenger, and $1,500 for the four-door seven-passenger machine with this type of body.

Warner Gearset and Steering Gear for 2,400-Pound Cars

TWO new parts have recently been brought out by the Warner Gear Co., Muncie, Ind., for cars weighing around 2,400 pounds. One is a selective gearset known as model T 39 and the other is a steering gear model S 10.

The gearset is a three-speed and reverse type with cone clutch and center control and designed for a unit power plant construction. The control levers may be mounted directly above the case or at the rear as desired. The shifting mechanism is carried in a separate casting which forms the cover of the case. This is readily removed and gives easy access to the gears and bearings. An interlocking arrangement positively locks the gears in and out of mesh.



Warner steering gear and gearset for cars of about 2,400 pounds

The gear case is of aluminum. The gears are three and one half per cent. nickel, forged steel, 6-8 pitch and .625-inch face, mounted on alloy steel shafts. The main shaft is of the four spline type, thus holding the gears rigidly in position when in mesh. Annular bearings are used in mounting the mainshaft while the countershaft is keyed to the gears and rotates on plain bearings.

The control lever is a one piece forging, of the ball and socket type, with the lower

end acting directly on the shifting forks with no connecting parts between.

The clutch is a leather faced pressed steel cone, spring cushioned to give gradual engagement and avoid grabbing.

Clutch Spinning Prevented

The light construction used insures against clutch spinning and this is further prevented by use of a brake mounted on the clutch shaft. Thrusts are taken on ball thrust bearings, and all wearing parts are hardened to insure durability.

The clutch is run dry and allowance for oiling the bearings from the gear chamber is provided by a hole drilled through the center of the clutch shaft.

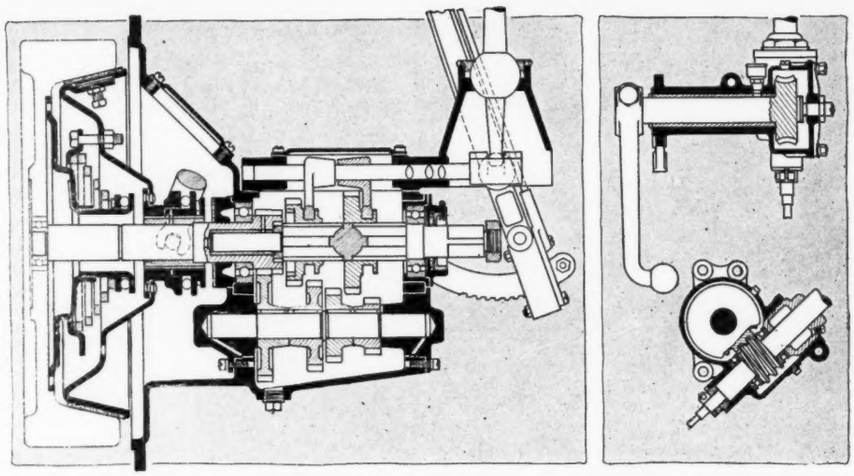
The Steering Gear

The steering gear is of the fore and aft steering type. It is a worm and full gear design, with allowance made for outside adjustment to take up the wear between the worm and gear.

Both worm and gear are of heat-treated steel, accurately ground to size. The thrust of the worm is taken at both ends upon ball thrust bearings, thus insuring ease of action.

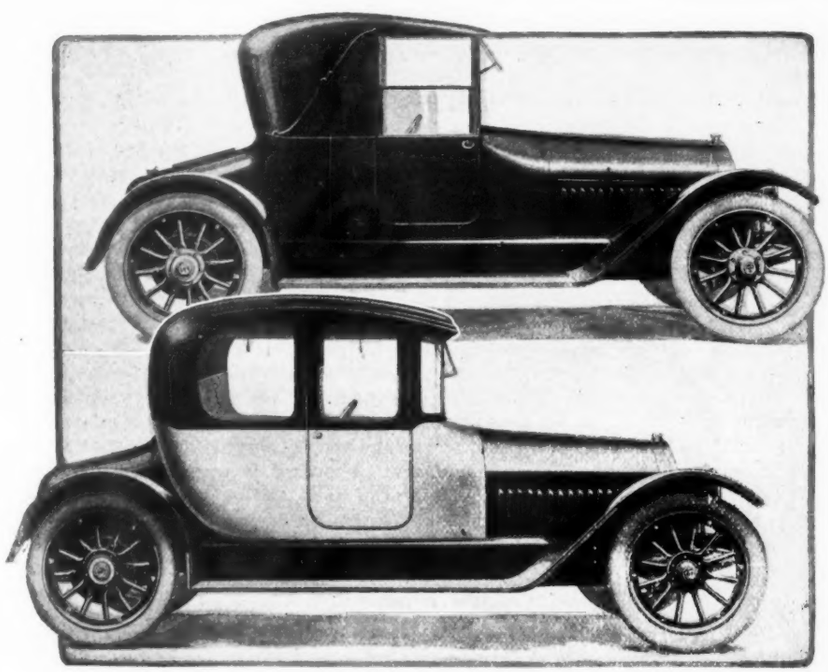
The finish is black enamel, with the controls mounted on the wheel in nickel.

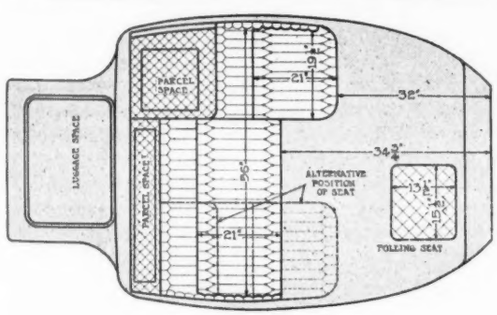
A large hard rubber electric horn button is mounted centrally above the control levers. A 17 inch stained rim is used on a black enameled malleable spider. Sections and exteriors of both the parts described are shown in the illustrations.



Left—Section through new Warner gearset. Right—Plan and elevation of Warner steering gear

National Has New Coupé and Cabriolet Bodies





Top—1915 National cabriolet on Series AA chassis. Below — Four-passenger coupé. Bottom —Diagram of optional seating arrangement in the latter

INDIANAPOLIS, IND.—Two 1915 closed car models, both of which are constructed on the standard six-cylinder chassis, have been announced by the National Motor Vehicle Co. of this city.

The coupé is a real four-passenger car being considerably larger than the usual coupé body. It lists for $2,850 complete. An option of seating arrangements is offered, as illustrated by the accompanying diagram. Three passengers are carried on the main seat which, if desired is arranged in a staggered fashion, the center seat set back of the others, similar to the style adopted by some of the electric makers.

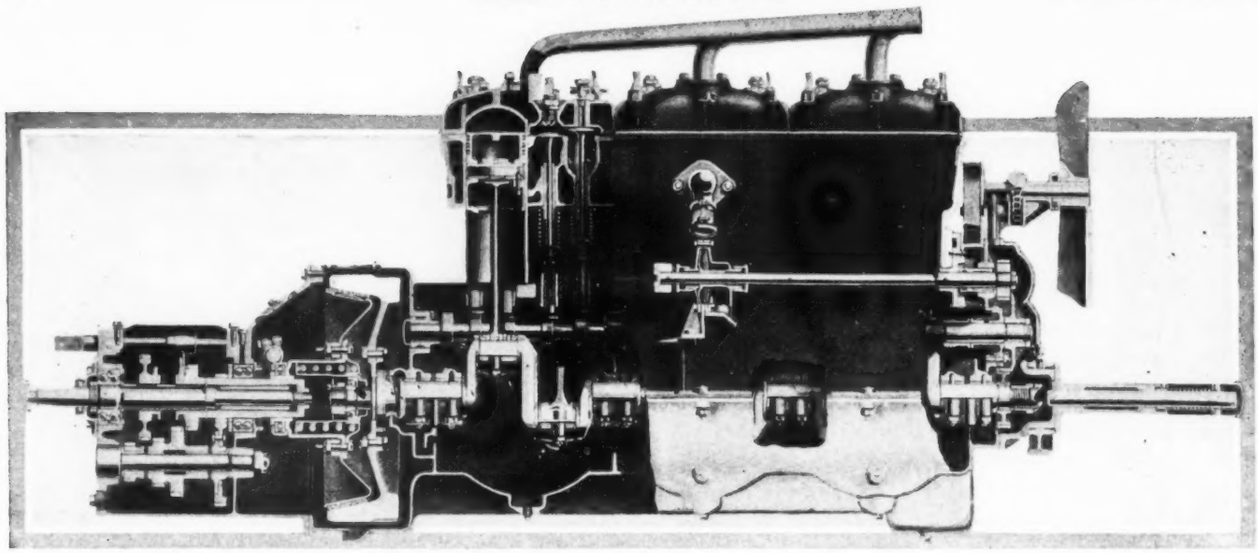
An idea of the seating arrangements possible with the coupé may be gained from an inspection of the diagram at the bottom of the illustration. The dotted lines show the alternative position of the seat at the right. The diagram is placed immediately below the coupé in such a way that one may see just how the body fits on the chassis.

Two package compartments are provided inside and a large luggage space is accessible from the outside. Choice of color, finish and upholstering is offered without any extra charge.

The National cabriolet is constructed on the series AA roadster chassis and lists for $2,700. It accommodates three passengers.

The upper part of the body is of genuine leather, especially finished to withstand the weather. According to the company, it is absolutely waterproof and does not crack.

The top folds back easily, and the glass of the doors lower into the lower half. The top part is inclosed with a neat covering, giving the car the appearance of the regular six roadster.



Part sectional view of Northway unit power plant used in the new Paterson six. The bore and stroke of the motor are, respectively, 3 1-2 and 5 inches. Note detachable cylinder head

Paterson Adds $1,495 Six—Reduces Four

Smaller Model Cut to $1,095—New Block Motors 3½ x 5—Detachable Cylinder Heads—Floating Rear Axle—Only Chassis Change in Four—Electric Starting and Lighting

THE W. A. Paterson Co., Flint, Mich., has added a six-cylinder touring model at $1,495 and is continuing its low-priced four-cylinder car at a reduction from $1,197 to $1,095. Last season only the four-cylinder chassis was supplied, on which either a touring or a roadster body could be had, but manufacturing policy of specialization has led to the abolishing of roadster models, only the two touring bodies being listed.

The Improved Four

In the continued four, the motor has been somewhat redesigned to give more power due to higher speed of operation, and a floating rear axle replaces the former semi-floating construction. The body lines have been improved by sloping the bonnet into the cowl.

The four has a wheelbase of 112 inches and is equipped with 33 by 4 straight-side tires, and the six wheelbase measures 124 inches and its tires, also straight sided, 34 by 4.

Northway Motor Used

Motors are of the latest type and conform to the same features of construction, the six being larger and stronger wherever necessary to accommodate the two additional cylinders. Cylinder heads are detachable and the cylinders cast in blocks of L-head form with valves on the left.

Much the same outward appearance on a larger scale is given the new six, which like the four has a Northway motor. The cylinder dimensions of both are 3 1-2 by 5 inches and practically the same general lines of design are adhered to throughout in both machines. They use the combination Delco cranking, lighting and ignition unit, unit power plants, left drive and center control, floating axles, three-speed gearsets and drive through torsion tubes.

PATERSON FEATURES

Four-Cylinder Model $1,095	Six-Cylinder Model $1,495
Redesigned Motor. 3½ by 5	Motor Size. . . . . 3½ by 5
S. A. E. Horsepower. . 19.6	S. A. E. Horsepower. . 29.5
Valve Openings, Clear. 1⅝	Valve Openings, Clear. 1⅝
Wheelbase 110	Wheelbase 124
Straight-Side Tires. 33 by 4	Straight-Side Tires. 34 by 4
Rear Axle. . . . . Floating	Rear Axle. . . . . Floating
Starting and Lighting, Electric	Starting and Lighting, Electric
Gearbox . . . . . Three-Speed	Gearbox . . . . . Three-Speed
Fuel Feed. . . . . Gravity	Fuel Feed. . . . . Vacuum

Four-Cylinder Car Features

TAKING up first the design of the four-cylinder motor in detail, the detachable cylinder head is in one piece and is held in place by a number of specially heat-treated steel bolts with a copper gasket interposed between head plate and cylinder block to make a tight joint. The cylinders and the upper part of the crankcase are cast together, whereas the lower part of the crankcase, with which the oil reservoir is cast as a unit, is made of aluminum. The standard method of supporting a unit power plant in the frame is adhered to in that the two rear supports are integral with that part of the crankcase housing the flywheel and extend to the side rails, whereas the front center of the case rests upon a frame cross member.

Although this motor is the same in dimensions as that used last year, having a displacement of 192.4 cubic inches, it is so

designed as to give more power due to a greater maximum speed, to lightening the reciprocating parts and to increasing the clear opening of the valve from 1 9-16 to 1 5-8 inch. The S. A. E. horsepower rating is 19.6. On the block it delivers as 37 horsepower when operating at 2500 r.p.m. This is quite high speed as compared with average domestic practice.

Modern practice prevails throughout this Northway design. There is no alteration in the three-bearing crankshaft over last year, but the pistons have been crowned which gives them maximum strength along with light weight. The pistons are fitted with nine thin carbon steel rings each, three to each ring slot. This is a growing tendency and has the advantage of making the leakage of gases past the pistons more difficult than with the older method of using three large rings. The gases must go past nine ring joints to escape instead of three, and further, the rings soon lap themselves into the cylinders due to the small wearing surfaces.

Drop-forged connecting rods have strap ends bolted in place. The camshaft is a drop forging with integral cams and is carried on three bearings. Spiral timing gears drive the camshaft as well as the pump shaft on the right side.

Tungsten Alloy Valves

The valves are constructed of the latest alloy which is said to be proof against pitting. It is a tungsten steel composition which has the property of remaining hard at high temperatures. The valves and springs are well covered by two plates, and breathing from the crankcase is by the vents in these covers so that there is communication through the tappets from within the engine to the outside air.

The motor is fitted with a Stromberg carbureter attaching to a two-branch manifold coupling to the cylinder openings below the exhaust header. The feed is by gravity.

Constant-level splash lubrication has the oil pumped from the reservoir into the crankcase by a small plunger pump operated by the camshaft. The amount of oil pumped is regulated by an adjustment which controls the stroke of the pump. After reaching the crankcase, the lubricant is distributed equally from basin to basin by small troughs cast on the inner side of the oil pan, which troughs run down from one basin to another. The troughs receive a part of the oil splashed up by the dipping of the rod ends into the basin, so that the system is of a distributing type which keeps the oil level constant in all the basins regardless of the angle of the engine.

Cooling is by centrifugal pump driven by a shaft on the right. It delivers the water into the center of the jacket, and the design of the water connections is such that free flow is allowed to go on unhampered.

Delco Unit Employed

Back of the water pump and driven by the same shaft is the Delco combination electrical unit which takes care of all electrical functions of lighting, cranking and ignition. The ignition distributor is vertical and in unit with the motor-generator proper. This Delco apparatus is the latest model and is much improved over its predecessors. The principal change is the current control which is connected with an automatic spark advance arrangement—another new feature. This current controlling device is purely a mechanical affair and consists of an arm wiping a brush over a coil wound so as to cause maximum current output at low car speeds. The main advantage gained is that when the car is running at average low speeds of from 10 to 15 miles an hour, the battery is being properly charged. As to the automatic spark advance, this consists of a centrifugal form of governor which automatically advances the spark when the speed of the engine increases within a certain range of the position of the hand spark lever on the steering wheel.

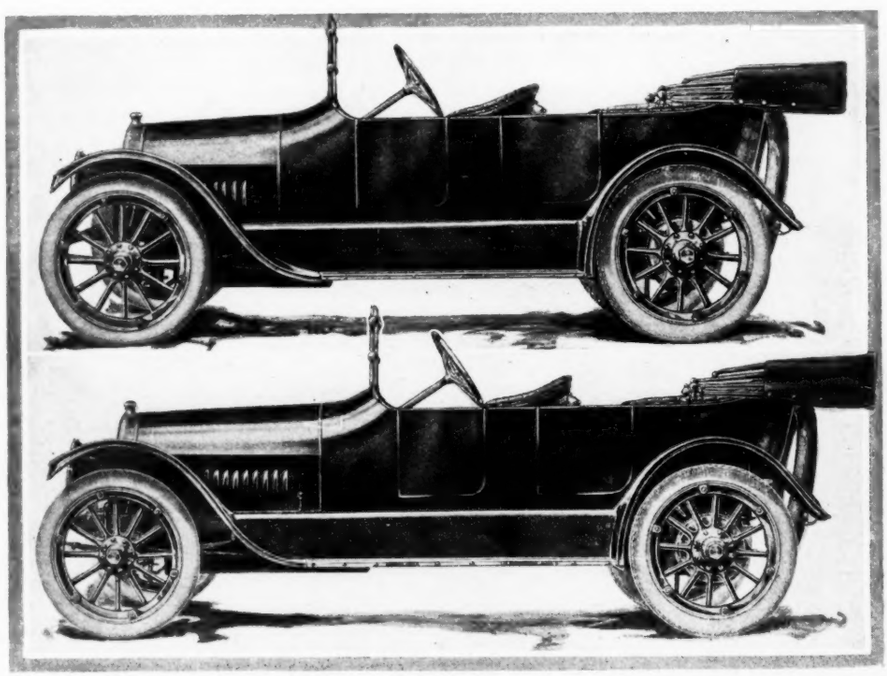
The familiar gear connection to the teeth in the flywheel face is used for cranking, the motor-generator then being temporarily and automatically transformed into an electric motor. The gear train which shifts into mesh with the flywheel teeth is completely and compactly housed within a case which is integral with the flywheel housing at the right rear supporting arm. For performing starting duty, the operator presses a pedal, which meshes the gears and sends current from the storage battery to the unit. When not used for starting, none of these gears is in mesh which saves wear as well as eliminates noise. The reduction in these gears is about 25 to 1, that is, the electric motor works about 25 times as fast as the crankshaft.

The system is of the 6-volt, single-wire type and the battery is mounted on the right side of the gearbox, between it and the frame.

Inclosed Cone Clutch

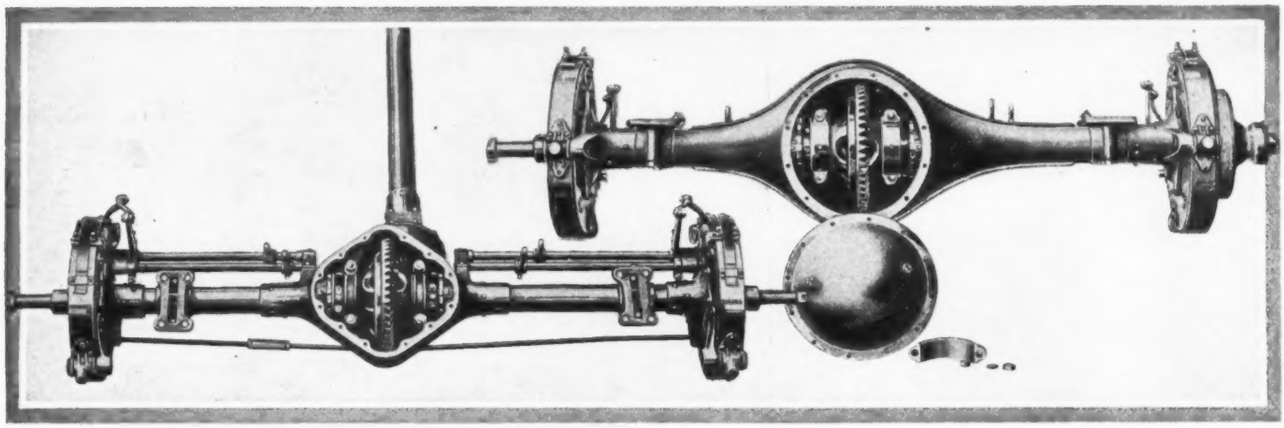
The bell housing at the front of the gearbox bolts to the flywheel housing, so that the cone clutch is completely inclosed. This clutch is faced with leather and easy engagement is provided for by the placing of springs under the leather. There are six of these springs.

The gearset a standard three-speed type has shafts and



Above—Four-cylinder Paterson for 1915, which sells for $1,095 fully equipped and fitted with Delco electric starting, lighting and ignition system. Tires are straight-sided, 33 by 4. Fuel feed is by gravity. The car has a new Northway motor, 3 1-2 by 5, and the only chassis change is the introduction of a floating rear axle

Below—Six-cylinder Paterson, listed at $1,495 with complete equipment. This car uses a motor similar in design to that in the four and with the same bore and stroke. Three-speed selective gearsets are used in both models. Tires on the six are 34 by 4. Fuel feed is by the Stewart vacuum system



Left—New floating rear axle used in Paterson four-cylinder model with cover plate removed. Note inclosed propeller shaft and arrangement of brake rods. Right—Floating axle used in the six-cylinder

gears made of nickel alloy steel, heat-treated and tempered. The gear ratios are: Intermediate, 1.76 to 1; low, 3.36 to 1; reverse, 4.32 to 1. Center control is not changed, the gear-shifting lever and the emergency brake lever bolting as an assembly to the rear of the gearcase.

The drive back of the gearset is not changed. The peculiar torsion tube construction surrounding the propeller shaft is very efficient. The front end of the tube houses a thrust bearing on the drive shaft. Thus the drive is taken by this bearing.

Practically the only chassis change is the substitution of a floating axle of demountable type in place of semi-floating construction. This axle is fitted with a cast housing of compact design. Wheels and differential run on Hyatt roller bearings, and New Departure ball bearings are used to support the pinion shaft. The axle shafts and gears are of nickel steel, and due to the floating construction, axle main shafts, differential gears and bevels may be removed without disassembling the housing.

Internal and external brakes acting on the rear wheel drums are fitted. Springs are three-quarter elliptic in the rear with scroll ends. The frame is pressed from 3-16 inch stock, of bottle-neck design and there is a rear kick-up to take care of axle movement. Standard 56 inch tread is used.

The Six-Cylinder Model

THE Northway six-cylinder motor used is practically the same in design as that already described. The cylinders are in a block, but instead of using a single detachable cylinder head plate, there are three of these, each covering two cylinders. Of unit power plant form, the engine is very compactly arranged, and in it practically the same improvements are found as in the four.

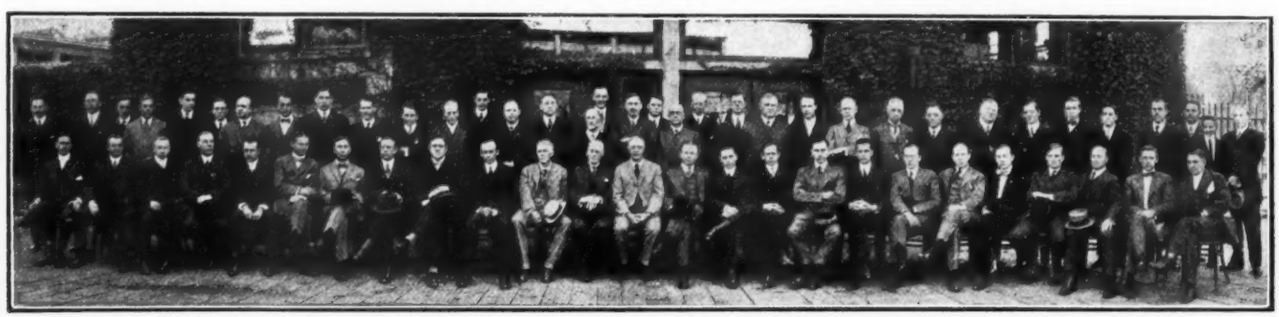
The S. A. E. rating is 29.5 horsepower. With the same dimensions as the four, it has a displacement of 288.6 cubic inches.

The casting of upper half of crankcase with cylinder block, the use of nine thin steel rings per piston, and the fitting of the same Delco unit as the four carries are proofs of the standardization which the Paterson company has adhered to. The Stromberg carbureter is used.

Like the four the six has cone clutch, three-speed selective gearset and inclosure of the propeller shaft within a torsion tube with the same distinctive thrust bearing design. The rear axle is somewhat different from the new axle of the four. The six axle uses a pressed-steel housing and Hyatt and New Departure bearings as in the other. The reinforcements of the housing make it extremely rigid.

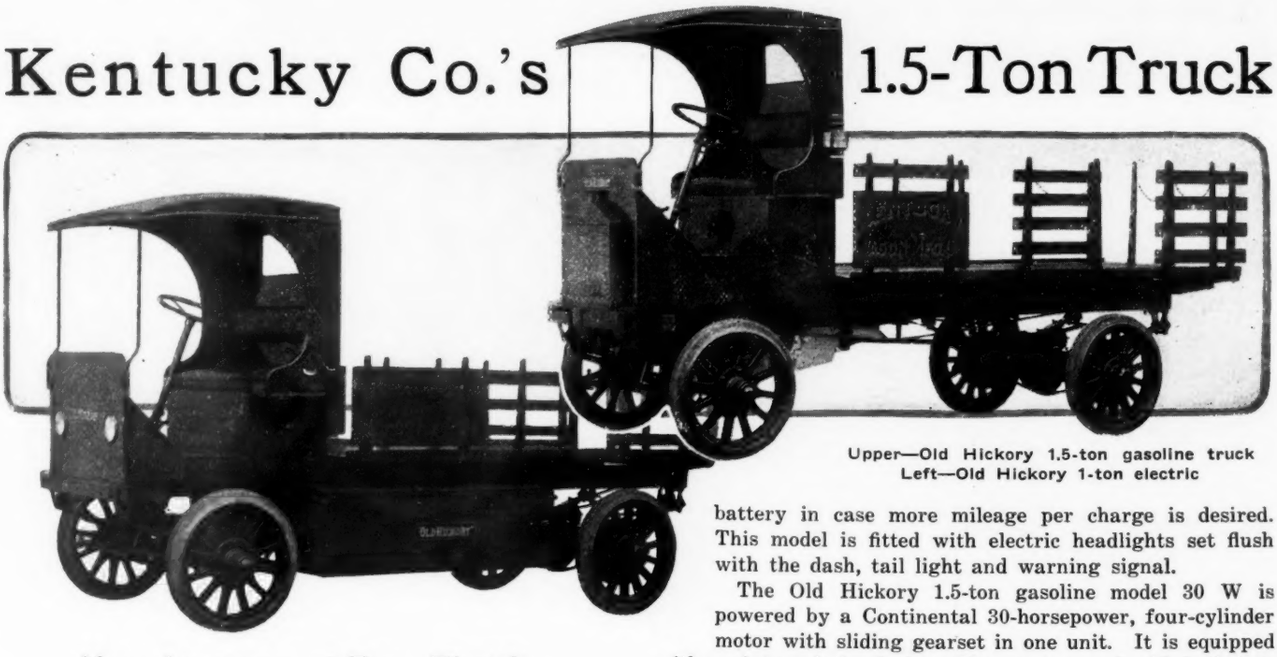
Stewart Vacuum Feed

The Stewart vacuum system of fuel feed is fitted to the six only. The tank is mounted on the end of the exhaust manifold and high enough to give gravity feed to the carbureter. This vacuum tank is of standard Stewart make, drawing the fuel by suction from the supply tank into its upper portion and then allowing it to flow into the lower part as needed, the latter part being open to the atmosphere. From this lower part it flows to the carbureter.



Pierce-Arrow Salesmen's Convention held recently at Buffalo, N. Y. Top row, left to right. H. G. Groesbeck, Cincinnati, Ohio. J. W. Maguire, Boston, Mass. W. H. Welker, Grand Rapids, Mich. J. S. Williams, New York, N. Y. W. G. Shortal, Buffalo, N. Y. K. G. Kaffenberger, Buffalo, N. Y. A. E. Raffauf, Milwaukee, Wis. J. T. Stewart, 2nd, Omaha, Neb. Howard Klein, Buffalo, N. Y. F. J. Bailey, Buffalo, N. Y. J. C. O'Rourke, Buffalo, N. Y. H. W. Smith, Salt Lake City, Utah. S. A. Stephens, Denver, Colo. Charles Walters, Cincinnati, O. R. V. Law, Buffalo, N. Y. Charles Hanauer, Cincinnati, O. W. B. Newlin, Buffalo, N. Y. J. W. Dunlap, Chicago, Ill. J. L. Martin, Titusville, Pa. Geo. W. Shroyer, Dayton, O. G. B. Wuestefeld, New Haven, Conn. J. W. Downs, Pittsfield, Mass. H. Paulman, Chicago, Ill. R. O. Patten, Buffalo, N. Y. H. J. Sturdevant, Baltimore, Md. H. D. Sisson, Pittsfield, Mass. S. A. Miner, Hartford, Conn. A. A. Ledermann, Utica, N. Y. F. N. Prendergast, Washington, D. C. J. W. Bowser, Providence, R. I. E. C. Ulrich, Wilmington, Del. W. M. Ladd, Buffalo, N. Y. O. L. Weaver, Cleveland, Ohio. Two stenographers. Seated, left to right. Elliot Ware, Boston, Mass. C. R. Culver, Springfield, Mass. Wm. Grant, Toronto, Canada. W. S. Smith, Toronto, Canada. T. H. Mullen, Indianapolis, Ind. P. R. McCurdy, Pittsburg, Pa. W. H. Ellis, Newark, N. J. C. W. Cady, New York, N. Y. D. A. Odell, Minneapolis, Minn. G. H. McLin, Chicago, Ill. J. Elmer Pratt, Buffalo, N. Y. Charles Clifton, Buffalo, N. Y. Henry May, Buffalo, N. Y. E. B. Morgan, Philadelphia, Pa. R. E. Broatch, New Haven, Conn. F. P. O'Brien, Indianapolis, Ind. E. G. Broomfield, Philadelphia, Pa. J. H. Fassitt, Philadelphia, Pa. G. F. Bradshaw, Philadelphia, Pa. Edward Leu, Providence, R. I. Hamilton Barton, New Orleans, La. E. C. Wiley, Dayton, Ohio. R. B. North, Newark, N. J. Webb Mason, Davenport, Iowa. E. G. Mertens, Troy, N. Y.

Kentucky Co.'s 1.5-Ton Truck



Upper—Old Hickory 1.5-ton gasoline truck
Left—Old Hickory 1-ton electric

Also Announces 1-Ton Electric—Known as Old Hickory Models—This Marks Entrance Into Gasoline Field

TWO new models have been announced for 1915 by the Kentucky Wagon Works, Louisville, Ky. One of these is a 1.5-ton gasoline model, a departure for this company which heretofore has made electric trucks only; the other is a 1-ton electric. These two models use the one running gear. With the four carried over from last year, this makes a total of six models for the coming season. The two new models are to be known as Old Hickory, and they are to sell for $2,000 complete with stake body and cab for the driver.

The models carried over and their prices are as follows: 1,500-pound, $1,500; 1.5-ton, $1,900; 2.5-ton, $2,500, and 4-ton, $3,000.

A departure from previous practice is noted in the use of worm drive which is employed on both the new models.

The Timken, David Brown gear drive is used and Timken roller bearings support the worm and worm gear while the rear wheels revolve on the same type of bearings on a floating rear axle.

The steering wheel is on the left side on both models with control lever on the electric car and gear shift lever on the gas car at the left hand.

Battery Capacity for 45 Miles

The Old Hickory electric 1-ton model 20W is fitted with a battery of ample capacity to drive the machine 40 to 45 miles to a charge. The battery is carried on a steel sub-frame on each side and by removing the side covers all battery cells are accessible so that the gravity of the electrolyte can be taken without disconnecting the wires or removing the cells. The electric motor is suspended well forward between the battery compartments and is connected to the worm shaft, a propeller shaft equipped with two universals. This shaft is in a direct line with the motor and worm shaft when the truck is loaded.

The controller giving the various speeds forward and reverse is under the seat connected directly to the control lever and is readily accessible by removing the seat panel. The balance of the space under the seat may be used for extra battery in case more mileage per charge is desired. This model is fitted with electric headlights set flush with the dash, tail light and warning signal.

The Old Hickory 1.5-ton gasoline model 30 W is powered by a Continental 30-horsepower, four-cylinder motor with sliding gearset in one unit. It is equipped with an integral circulating oiling system and with both battery and magneto ignition, the Heinze dual system being used.

An enclosed cone clutch transmits the power to the gearset which is mounted on roller bearings and gives three speeds ahead. The gear shift lever is at the driver's left.

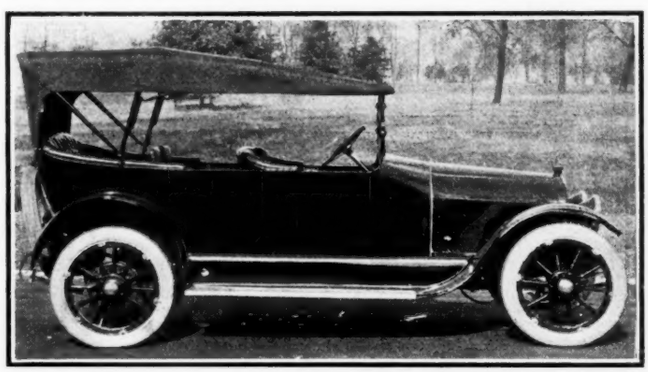
Clutch Operates Emergency Brake

The clutch pedal operates the emergency brake if operated with the service brake or while the service brake is applied. The gasoline tank is under the seat and feeds by gravity through a short copper pipe to the Holley one adjustment carbureter.

The Old Hickory Model 30W gasoline truck is fitted with oil side lamps, tail lamp and horn.

The double set of brakes are both directly on the wheel drums. Both the service and emergency brakes are operated by pedals and are fitted with equalizers.

To give added strength without detracting from its flexibility all frames are trussed on each side in exactly the same way as a railroad car. The springs are long, broad and flat, no troublesome shackles being used. The bronze wearing plates at the rear end of the springs, allow the necessary movement and also act as shock absorbers, deadening the rebound on rough roads.



The Moon model 6-40 at $1,575 is now being built in six-passenger type, as illustrated. To accomplish this, the wheelbase has been lengthened to 122 inches, and the frame increased in size, and notwithstanding this, the weight of the six-passenger is identically the same as the five-passenger, namely, 2,950 pounds. Model 6-40 is equipped with a 3½ by 5 six-cylinder Continental motor, unit power plant, Delco starting and lighting system, etc.

Vacuum Air Valve in Browne Carbureter

Position of Air Valve Determined by Vacuum at Nozzle —One Size for All Motors

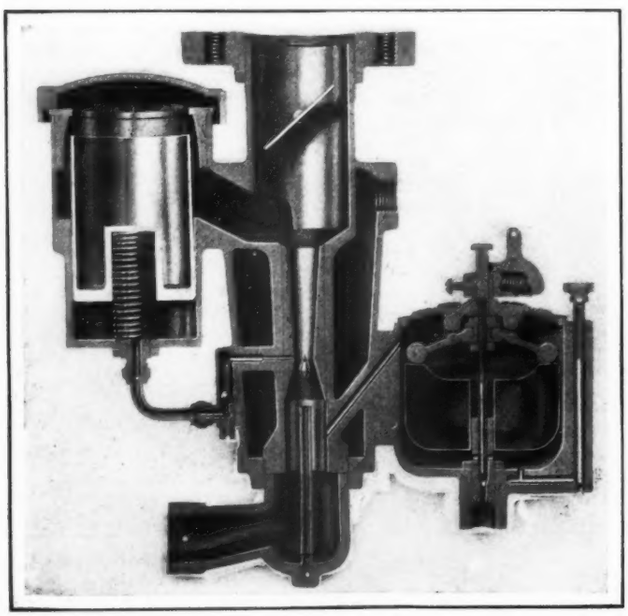
THE feature of the new Browne carbureter, for which the Holt-Welles Co., 1790 Broadway, is the selling agent, is the vacuum-controlled, auxiliary air valve by which, it is stated that a constant ratio between the fuel and the air is maintained at all speeds and throttle openings.

One Size for All Motors

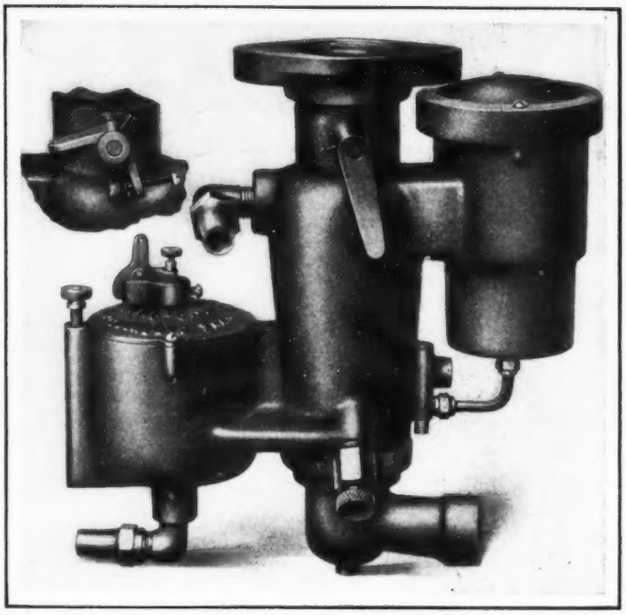
Only one size of carbureter is manufactured for all motors, and the only change for different motors is to put in a new bushing which surrounds the auxiliary air valve, and controls the area of the auxiliary air opening. Large motors use bushings with more sharply outcurving surfaces than small motors.

The same venturi construction is used regardless of the motor size. The throat area is small, insuring sufficient velocities to atomize the fuel at even the lowest speeds, it is stated. Friction at this point is reduced by giving the venturi a 30-degree approach and a 7-degree discharge.

The main air inlet is at the bottom whence the air passes up through the venturi where it mixes with the gasoline. Additional air is supplied by the auxiliary air valve at the left. This valve is an aluminum piston whose position is determined by the amount of vacuum in the chamber under it. This chamber is connected with the venturi, the opening of the passage being at the same point as the spray nozzle. The result is that the vacuum acting on the fuel and on the piston valve is exactly the same, and for a definite amount of vacuum, the valve must assume a definite position, therefore, for a certain rate of fuel flow, which is determined by the vacuum, the valve must take a certain position. There is a bushing, as previously noted, with a curved surface which surrounds the upper edge of this valve so that as the opening of the valve increases the area through which the auxiliary air may flow becomes greater. The curve of this surface is so calculated that for a given position of the valve, as determined by the vacuum at the spray nozzle, the amount of air to give a correctly proportioned mixture is obtained. For a wider throttle opening the vacuum increases, the rate of fuel flow becomes greater, and the valve takes a new position. Due to the curved surface of the bushing the new area of the auxiliary valve allows enough added air to give a perfect mixture, for this throttle opening, it is stated.



Section through Browne carbureter. The auxiliary valve is at the left. Note the dashpot control



Exterior of Browne carbureter showing arrangement of parts

Fluttering Prevented

Fluttering is prevented by means of a small ball which is held slightly off of its seat in the passage leading from the throat of the venturi to the air valve. When the air valve is depressed the ball offers no resistance but when the valve attempts to close a certain resistance is interposed to prevent fluttering. This arrangement also serves another purpose. When the throttle is suddenly closed there is a tendency for the fuel to keep on flowing at the same rate due to inertia. Were the air valve to close as suddenly the mixture would become too rich. The air valve is, however, retarded by the ball in the same proportion as the fuel flow is continued, thus maintaining constancy of mixture during this period.

A hot waterjacket is fitted and the main air inlet is finished so that a hot air pipe may be attached.

Easy to Get At

Accessibility is a feature. The carbureter may be taken entirely apart without removing it from the motor. The auxiliary valve may be lifted out after the dust cap is removed. The float mechanism may be inspected or removed after taking off the cover to the float chamber. Dirt from the seat of the float valve may be dislodged by means of the milled head on the upper end. The fuel nozzle may be cleaned by unscrewing and withdrawing the needle valve and inserting a piece of fine wire or a hat pin. The float chamber may be drained by loosening the needle valve at the extreme right of the sectional view.

Priming of the carbureter for starting is accomplished by pulling the priming lever on the top of the float chamber. This raises the needle valve and allows gasoline to flow into the float chamber until the level has raised sufficiently so that fuel runs down the diagonal passage into the main air passage.

New Stromberg Has Dashpot Type Control

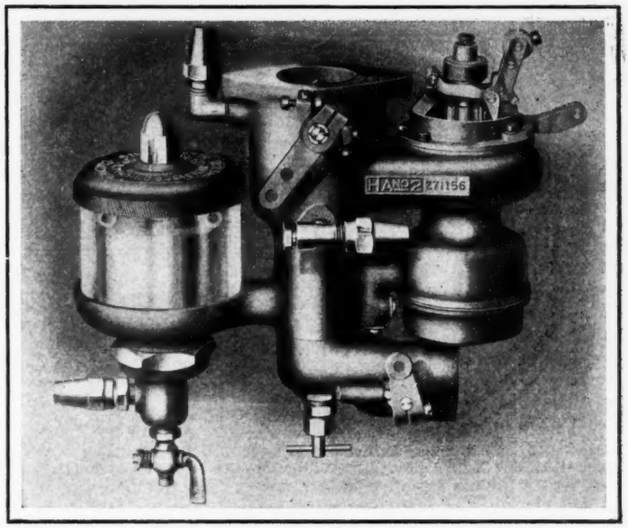
Secondary Jet and Air Valve Regulated by Dashpot— Horizontal and Vertical Flow Types

THE Stromberg Motor Devices Co., Chicago, Ill., has brought out a new type of carbureter embodying the dashpot principle in the control of the secondary fuel jet and air valve. This carbureter appears in three forms all of which adhere to former Stromberg practice of using separate low and high-speed functions, the former being by a set nozzle and the latter by the expanding carbureter portion of new construction. The three models are the H, a vertical type unwaterjacketed, the HA the same carbureter with waterjackets and the HB the horizontal type unwaterjacketed. The latter is exactly like the H with the exception that the mixing chamber is horizontal instead of vertical.

In the new Strombergs the motor is fed the proper mixture below 25 miles per hour from the low-speed jet with air from the primary intake and above that speed the auxiliary air valves come into action and with it the secondary nozzle, which is interconnected with the air valve.

When the car is running less than 25 miles per hour the low-speed nozzle only feeds the fuel and above that speed the dashpot comes into play. The piston shown is .01 inch smaller than its chamber and the fuel entering must work its way around the piston. Integral with the piston is a sleeve to which is attached the air valve. Within the sleeve is the secondary needle, which rests upon a seat shown and has at its upper end a button. The spring within the sleeve holds the needle in position. Should the air valve open, it carries with it the needle and at the same time forces the piston downward against gasoline pressure. However, the needle travels only through the distance AB. This is true because movement downward of the air valve carries the needle but, as soon as the button strikes the nut B, it will stop. While the needle is held stationary the valve may continue to move and so move the seat away from the valve.

In action the piston compensates for lag in the fuel. That is when the throttle is opened the air valve is not allowed to open quickly and thus cause poor carbureter action but instead acts against the fuel in the chamber and opens slowly.

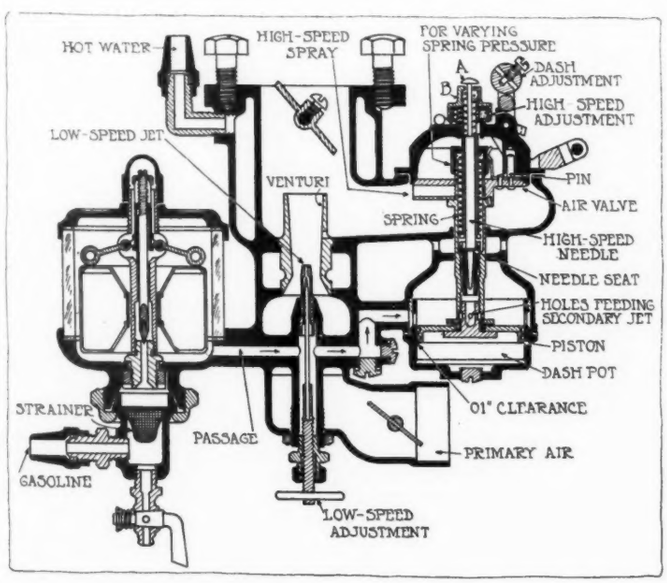


Exterior of Stromberg model HA, with dashpot control

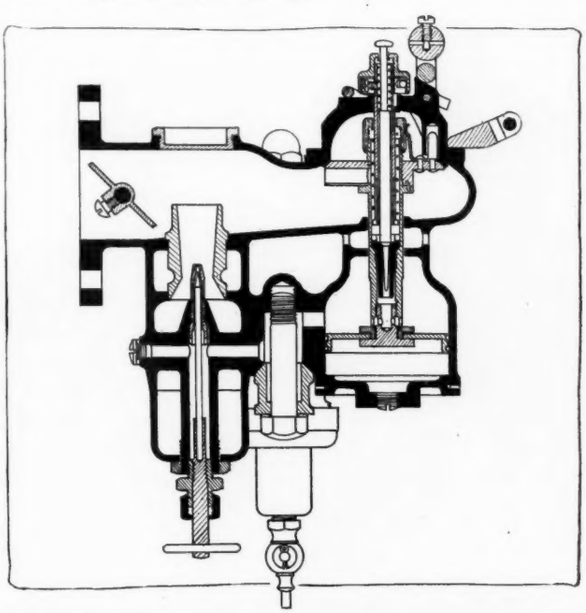
When the fuel is in the chamber and the secondary air valve is opened by increased suction, fuel makes its way up through the holes at the top of the piston and thence through the sleeve to the tube integral with the air valve. The fuel leaving this tube is carried away with inrushing auxiliary air and forms the high-speed mixture. One important feature of this carbureter is right in this construction which prevents the secondary fuel spray from touching any metal as it leaves the tube and also getting better mixing by having the fuel meet the air which is at high velocity.

The primary nozzle adjustment is in the form of the handle shown and the secondary by means of the knurled nut at the top of the air valve. The dash adjustment, a series of levers, not only lifts the secondary needle from its seat but also locks the auxiliary air valve, so that on starting the engine gets a good mixture with the air supply shut off entirely, provided the primary air intake is closed by the butterfly valve.

In these new Strombergs the glass chamber and float construction are practically unaltered.



Left—Stromberg vertical type with the different parts designated.



Right—Horizontal type, similar except for position of flange

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From Report to Reality

SIXTY miles per hour in a stock touring car, with top and windshield up and with a load of five passengers, is no longer confined to the realm of conjecture or salesman's arguments but has become an official reality, by the Marmon speedway test in which a registered stock car traveled over 62 miles in the hour on the brick speedway. This performance is the best attribute to progress in automobile engineering in America and is one of the most applicable answers to those critics who ask, "How permanent has been the progress of the last 5 years?"

It is scarcely that long ago that a prize was offered for stock touring cars with load and windshield up that could travel a mile in 60 seconds going one direction on the speedway or road and then travel in the opposite direction and make 60-mile-an-hour pace for a distance of 1 mile. The makes of cars then foremost in the racing world tried but made signal failures. Today, while but one make has officially performed the feat of not only going 1 mile but 60 at a sustained speed, there are doubtless several other makes that could show a sustained speed of over 60 miles per hour.

Sustained speeds of this rate show that improvements have been at work in many parts of the car in lightening, balancing, tires, etc.

The Reward of Genius

FORD'S annual statement for the last fiscal year showing an increase in the surplus during the 12 months of more than $20,000,000, and a total surplus of over $48,000,000, is epochal. Never before in the motor industry has such a balance sheet been revealed, and very rarely in industrial lines is it exceeded, save by a few of the large corporations.

This annual statement coming from an industry not more than 15 years old partakes of the nature of a prodigy, a condition considered impossible 5 years ago in the automobile industry by the most sanguine.

Most phenomenal in connection with this statement is that such enormous profits are the outcome of production facilitated to the final syllable of perfection. Ford proved, as his year's progress shows, that perfected production methods do not necessarily mean greater physical and mental strain on the workmen, but rather the elimination of the un-essential, the un-necessary. His factory assembly method has been renovated, and by his new system of locomotive assembly, the endless-chain system, the workman is relieved of every possible burden, and is left free to confine his efforts to useful productive work.

That such profits and such a continued growth can come from the manufacture of so cheap a car but once more indicates the lines along which genius so often travels. It again demonstrates the strength of the masses as opposed to that of the classes. When Henry Ford first presented his four-cylinder car at the show in New York, in response to the object he had in designing a cheap car the answer came, "I have set out to build a car good enough for an American to ride in."

Here is the reward of genius and consistent endeavor. Genius mapped out a field undreamed of by others; and annual balance sheets disclose the reward.

The Maelstrom

IT is to be hoped that the floating axle patent litigation which has at last been started will not permeate the entire industry and while it will not have any deterrent effect on the purchasing powers of the country. It is bound to create more or less division in the industry as well as unrest among the many companies that own patents, that they believe to be valid and which they could bring out of their strong boxes and use to the discomfiture of other makers, if they so desired.

The unfortunnate aspect of patent litigation is that so much money and energy are expended in this work that could be expended in improving production methods. Ford estimates his patent assets at a few thousand dollars and yet his annual statement shows a profit of over $20,000,000. Production with him has been more valuable than patents.

There are more than 1,000 different patents referring to the automobile that are owned or controlled by the car and accessory makers. What if suits were brought on all these?

Road Congress Ends Big Session

Over 3,000 Delegates, Representing Every State in Union, Demand Federal Aid in Trunk Line Building

By J. C. Burton
Staff Correspondent

ATLANTA, GA., November 14—"Uncle Sam, Road Maker" reads the sign that soon will be dusted off and nailed to one of the white pillars of the national capitol at Washington.

This is the prediction emanating from the fourth American road congress which closed the most successful session in its history here today. More than 3,000 proponents of highway improvement, representing every state in the union, are the authors of such a prophecy. They also will be prominent agents in its fulfillment. They have called upon the federal government to act and to act immediately. They have demanded the passage of a bill in congress that will provide for federal aid in the construction of main trunk lines throughout the United States.

Within the past 6 days, the American road congress has developed a backbone. For the first time in the history of the organization, it has made demands, definite demands, and back of these demands is a determination to push them until they are complied with. The polite verbiage in which the demands are clothed is but a kid glove over a mailed fist. Legislators, who pay no heed to the recommendations of the road congress, probably will find that out very soon.

Federal Aid for Main Routes

Federal aid in highway construction was the keynote of the 1914 congress. Monday's session, in charge of the American Automobile Assn., was devoted entirely to the subject of national legislation and the two principal speakers of the day, Senator Hoke Smith of Georgia and Representative W. P. Borland of Kansas, each promised to work for the passage of a bill that would make federal appropriations for highway construction possible. The resolutions committee, the official mouthpiece of the congress, gave the subject of federal aid the place of prominence on its list of recommendations, the resolution reading as follows:

"Resolved: That the American road congress emphatically endorse the principle of federal co-operation toward the construction of main highways and thus assist the several states to build the main market roads on the one-half of country devoted to agriculture and to build through main roads in the one-half of country which is not predominately agricultural but whose prosperity depends upon mining, the raising of live stock and the presence of the healthseeker and tourist."

"Federal aid for roads and not for the pork barrel" was the slogan of the congress. One delegate, President Kenyon of the Indiana Good Roads Assn. expressed the sentiment of the 3,000 and more proponents of highway improvement in attendance when he declared, "Shake your fist under the nose of your congressman and tell him that if he is not in favor of federal aid, you are not in favor of him."

Commission to Spend Money

The plan which the federal government should pursue in aiding road construction, as generally outlined by the dozen or more speakers who addressed Monday's session of the congress, is to have whatever funds congress might appropriate placed in the hands of a competent commission, which shall select the locations for the expenditure of the money. It was argued that to appropriate good roads money in "pork barrel" fashion, as much as it would boost the stock of individual congressmen back home, would result in little practical or lasting improvement of the highways. Such a procedure would merely smear an insufficient fund thinly over a large territory.

It is the belief, however, that the commission empowered to dispense the fund should place the money only after a most careful study of conditions in each and every state. Thus trunk roads would be built where they are most badly needed and most used. The plan of the road congress is that the states and not the national government shall bear the expense of the general upkeep of the highways and it is further contemplated that the states through which federal aid roads are to be built shall appropriate proportionate amounts for the construction of feeder roads.

Money for Main Routes

Representative Borland of Missouri, who led the successful fight on the Shackleford post roads bill in congress last year, was the champion of the American road congress' plan for federal aid.

"I will not vote for a bill which spreads money over a large territory," he declared. "I want the money centered on some special mileage where it can do some real good whether a cent of it is spent in my county or not. We want a system of roads that will open our country up, but in their construction, we've got to follow a system. First, build the main trunk roads; then the provincial or county roads; after that the little by-roads will come.

"Building wagon roads is like building railroads. The railroads build their main trunk lines first, not their switches and small feeders. But there are congressmen and senators in Washington who in our highway construction would have us reverse the system of railroad building.

"The big highways cannot be consistently built and maintained by local districts. We must have a general and special fund for this with proper supervision of its distribution. The smaller roads are legitimate objects for local operations. We can't have a blanket law to build 250,000 miles of road. We have got to start somewhere on some specific road. We have got to realize that. It is folly to think that we can accomplish anything any other way.

"There is no division of interest between city and country on the point of good roads. The business of the country is the foundation for the business of the city. The national government should build highways through Georgia and Kansas for the same reason as it appropriates millions for the improvement of harbors of the ocean shipping points. It is just as important to get the cotton or wheat to the port as from the port."

The American road congress will fight any measure introduced in congress that does not provide for the appropriation of money for main trunk lines, roads that will rival the national routes of France, the imperial highways of Germany and the inter-county roads of England. In the past 3 years, 140 bills, providing for the use of federal funds for highway construction, have been introduced in House and Senate. Not one passed. They were too limited in scope or impractical, the majority of the measures carrying appropriations for the construction of special or insignificant roads. Of such a type was the Shackleford post road bill of the last session of congress, a measure that if passed would have spread $25,000,000 over a vast amount of territory and resulted, it is claimed, in the temporary building of highways largely in isolated districts.

New National Organization

The delegates to the congress are confident that such a federal aid bill will be passed. In order that all the forty-eight states will be in a position to enjoy the benefits accruing from such a bill when it finally is passed, the state highway officials in attendance formed a national association on Thursday. One of the chief aims of this organization will be to bring the building of roads under the supervision of state officials in the eight states that have no state highway departments—Georgia, Indiana, North Carolina, South Carolina, Tennessee, Arkansas, Florida and Texas. It is the belief that the federal aid bill will provide for the disbursement of the fund and the construction of the roads by the several state highway departments and unless these eight

states obtain state highway departments, they will be ineligible to share in the national benevolence.

The national association of state highway officials will hold a meeting in Washington, D. C., December 12, when the organization will be perfected, officers elected and a bill, embodying a plan for federal co-operation in road construction and to be presented to congress, will be drafted. The new association also will attempt to make all state highways uniform.

Besides stating definitely the stand of the American road congress on the question of federal aid, the resolutions committee, in its report, made several other important recommendations. It urged the formation of state highway departments in all states as essential to secure efficiency and economy in the construction and maintenance of roads, commended the Lincoln Highway Association for its voluntary efforts in building a transcontinental route from the Atlantic to the Pacific, deplored the frequent number of accidents on the highways and asked the authorities to enact necessary rules and regulations to insure the public safety, and called upon the government to build highways across all Indian and forest reservations and all other federalized areas.

For the past 6 days, Atlanta has been a great clearing house for the exchange of sound, sane, practical ideas on highway construction, improvement and maintenance. Since Monday, the city from which Sherman marched to the sea 50 years ago, has been a vortex of good roads enthusiasm. The attendance at the 1914 congress broke all records. More than 3000 delegates registered. Morover, it was a most representative meeting. Men from the North and South, men from the East and West, came here to teach and learn. Each of the forty-eight states in the American sisterhood sent state, county, township, commissioners and engineers and good roads proponents to the congress. On the eve of the general exodus from Atlanta, the feeling prevails that an epochal chapter in the history of American highway development was written at Atlanta.

Dixie's Great Chance

Fortunate indeed was the selection of Atlanta as the 1914 meeting place. The south is a most fertile field for the sowing of the good roads seed and during the past week, the army of delegates to the convention have scattered it far and wide with the result that Dixie eventually should harvest a crop of highways as valuable as its more famous cotton crop. Moreover, Atlanta and Fulton county are excellent laboratories in which can be seen the results of good roads experiments. Atlanta can boast of municipal street improvements that are the equal of any in the other metropolises and the county roads in the vicinity of the city are model types, rivaling the noted highways of Wayne county, Michigan and Milwaukee county, Wisconsin.

The delegates also had an opportunity to study the results of the convict road system at first hand and at its original source, for Georgia took the initiative in the movement to employ its prisoners on the highways, a movement that has spread rapidly within the last decade until now it has no geographical bounds.

Varied Program

The program for the fourth American road congress was all-embracing in scope. Monday's session was devoted entirely to the all important subject of national legislation and federal aid. State legislation was the topic for Tuesday morning and the merit system in road administration was discussed by speakers at the afternoon session. Problems in construction and maintenance were considered Wednesday and Thursday's session was a sort of pot pourri in which several topics, including system in road management, street construction and maintenance, convict labor, road making by the army and contract work, were discussed.

Valuable as the addresses in the large Taft hall were, it was evident that the impromptu discussions of highway commissioners and engineers in the hotel lobbies and around the machinery and material exhibits were even of greater value. Here the man from Georgia learned of a system from the man from Michigan that would solve his road problems. The engineer from Indiana discovered that the engineer from California had used a particular grader or scarifier and found that it was both efficient and economical and that it would give as good service on Hoosier roads as it had on the highways of the Pacific coast.

Road Machinery Exhibit

There were a larger number of exhibitors of road machinery and materials at the Atlanta convention than at any of the previous meetings of the American road congress and the United States government and the state of New York had two notable exhibits that attracted a great deal of attention. Uncle Sam sent to Atlanta a series of road models—to be shown at the Panama-Pacific exposition—which showed the evolution of road building for 2,000 years and included the Appian Way of 300 B. C., the early French roads of Napoleon, the English macadam highways built during the reign of George IV and the several types of modern roads. Father Knickerbocker sent a replica in papier-mache of Old Storm King, the mountain along the Hudson where engineers of the Empire state are constructing a new trail, 2½ miles in length and with an average grade of 7 per cent., at a cost of more than $500,000.

The American Highway Association, which, with the American Automobile Association, forms the American road congress, held its annual meeting Thursday evening when the following officers for 1915 were nominated: President, Fairfax Harrison of Virginia, president of the Southern railroad; vice-president, Logan Waller Page of Washington, D. C.; treasurer, Lee McClung of Washington, D. C., former treasurer of the United States. The following directors were nominated for a term of 3 years: A. G. Batchelder, New Jersey; Bryan Lathrop, Illinois; Leonard Tufts, South Carolina; W. Tom Winn, Georgia; C. E. Blaney, California; W. D. Sohier, Massachusetts, and S. E. Bradt, Illinois. These officers and directors will be formally elected at a meeting of the executive committee to be held soon.

At the annual meeting of the congress several cities put in a bid for the 1915 meeting, but it is probable that the invitation of San Francisco will be accepted since such a selection will give the delegates an opportunity of visiting the Panama-Pacific exposition.

Shaw Motor Incorporates for $1,000,000

PRAIRIE DU SAC, WIS., Nov. 14—The Shaw Motor Co., Chicago, Ill., which recently selected Prairie du Sac, on the Wisconsin River, as the site for its permanent factory, has filed articles of incorporation and a statement to do business in Wisconsin as a foreign corporation. The capital stock is $1,000,000 and the Wisconsin interest is given at $30,000. Contracts were awarded late last week for the machine shop, office and assembling building, to be 60 x 108 feet in size, 19 feet high, with saw-tooth roof. In addition, the company has the use of the former Kahn foundry for producing its light castings. It is hoped to start operations by Feb. 1, 1915.

$1,000,000 Company to Make Tire Machine

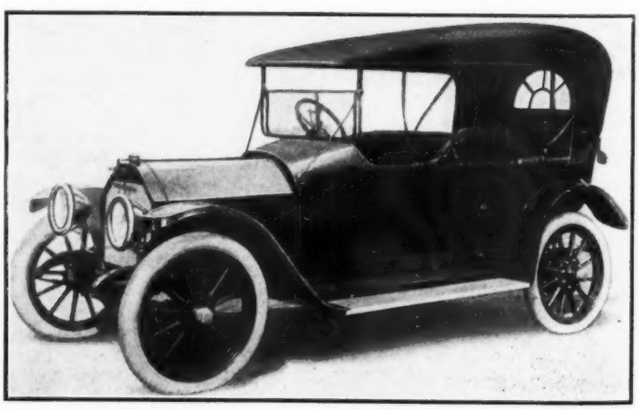
INDIANAPOLIS, IND., Nov. 14—The Dickinson Tire and Machine Co. has been organized and incorporated with an authorized capitalization of $1,000,000 at Indianapolis to manufacture a tire weaving machine invented by Fred S. Dickinson, of Bedford, Ind., and New York. The new machine will weave a tire in a solid piece, of the proper dimensions. The fabric will be woven bias to give maximum strength.

McIntyre Brings Out Six for $1,275

AUBURN, IND., Nov. 16—A six-cylinder car for $1,275 has been announced by the W. H. McIntyre Co., Auburn, Ind., for 1915. The car is fully equipped even to a one-man top. Power is produced by a six-cylinder 3.5 by 4.5 motor with cylinders cast in a block. The clutch and gearset are a unit with the motor. The clutch has twenty-one 10-inch disks and the gearset affords three speeds forward. The wheelbase is 120 inches and 35 by 4-inch tires with demountable rims are used.

LIMA, O., Nov. 16—The Willys-Overland Co. will manufacture at the Gramm plant in Lima only 1,350-pound delivery wagons. The force will be increased to an extent where five of the delivery wagons will be turned out daily.

John N. Willys, head of the company, recently deposited $100,000 in the Lima banks to take care of obligations against the Gramm plant, assumed when purchased from the former company several years ago. This was done in order to ease the money market of Lima.



New McIntyre six selling for $1,275 with full equipment, top, etc.

To Eliminate Non-Resident Registration?

Supreme Court Hears Arguments on Test Case—Washington Motorist vs. State of Maryland

WASHINGTON, D. C., Nov. 14—Is it legal for any state in the Union to require a motorist living in another state to take out a non-resident license for his car before driving in states in which he does not reside?

This question was brought up in July, 1910 by a Washington, D. C., motorist who was required to carry a Maryland license before he was allowed to drive his car in the state. The owner decided to make a test case of the matter and this case finally came before the Supreme Court of the country where it was argued last week. It is expected that a decision will be handed down in a couple of months. Should a favorable decision be received, motorists believe that the non-registration clause in all our states would be void and illegal.

Question Is Important

The test case is that of J. Tilghman Hendrick vs. the State of Maryland involving the question of whether or not Maryland has the constitutional right to impose a tax upon motor car owners in the District of Columbia who use the Maryland highways. In the argument for the Supreme Court this week, the validity of the tax was upheld by Attorney General Poe and Attorney Enos S. Stockbridge, while Hendrick's contention was presented by Osborne I. Yellott, counsel of the Automobile Club of Maryland and Jackson H. Ralston, of this city. The question is one of great interest to motorists throughout the country and the court's decision, which will be rendered within the next 2 months' will be anxiously awaited. Hendrick is a Washington man and refused to pay the tax in order to test the law. The main argument of his attorneys was that the Maryland act was a discrimination against the District of Columbia in favor of other states in that residents of other states in the union were not assessed for the license fee when they used the Maryland highways; whereas motor car owners of the District of Columbia are. They also contended that the act imposing a charge upon District motorists is a regulation of commerce beyond the jurisdiction of Maryland to impose. The Maryland law is a revenue act and not within that class of laws under which States are allowed to demand compensation for the use of works of public improvement. This follows, it was contended, since the tax on the District motor cars is imposed without regard to the extent of the use of the improvements. It was pointed out that there are 10,000 motor cars in Washington, 6,000 of which are barred from going into Maryland by the license tax.

Charge Big Salaries Are Purpose

Attorney Ralston also charged that the chief purpose of the tax on District motorists was to help pay big salaries to the members of the Maryland motor car commission. "The only reasonable purpose for which a District motorist using the roads of Maryland could be compelled to pay a tax," he declared, "would be that of affording proper police identification and should not in that case be more than $1. But instead of a logical fee of that sort, the charges on District motor cars run from $5 to $25. District motorists are obliged to pay not only an identification fee, but also for the enforcement of all the laws of Maryland roads affecting motor cars and the large salaries of the motor car commission, as well."

Not a Violation of Interstate Act

Attorney General Poe contended that the license tax was not a violation of the interstate commerce act on the grounds that "a state is justified in requiring those who elect to use on its highways a mode of travel that is abnormally destructive to that road to compensate it for such use. Let us direct attention to the results aimed at by this law," he continued, "bearing in mind that we are dealing with regulations of high-powered machines capable of causing great injury and destruction of life and property and a consequent difficulty of detection unless plainly and at all times distinctly marked. It is, of course, apparent that this law seeks to protect person and property by requiring the automobile to be registered, so that in case of damage and injury the owner may be located. All of these purposes are clearly within the police powers of the state and are among the primary objects of that power.

"What bearing does this, then, have on residents of the District? The court will take judicial notice of the geographical location of the District to the borders of Maryland; that the District contains a large and populous city; that it is limited in area and that therefore users of motor vehicles necessarily are forced to go frequently into the adjoining states. The court will also take judicial notice of the fact that there is no large city in any other state so situated with respect to the borders of Maryland."

Denies Right to Discriminate

Ralston denied the right of the state to discriminate against District motorists in favor of motorists who are residents of other states. He assured the court that there is nothing in the law to sustain the claim of Attorney General Poe that the state has the right to make a special discrimination against the District because of its proximity. He argued that such a premise is without valid foundation, as it includes all federal districts and territories.

Several questions relative to certain phases of the case were asked from the bench. The court particularly inquired about the charge that the law is a gross discrimination and why the District is put in the same class as Alaska.

Attorney General Poe's answer to these inquiries in general was made in an explanation that the District is of small area and having thousands of automobile owners who constantly make use of Maryland roads, the state is entitled to exact payment for the use of its highways and in the manner prescribed by the law now being attacked. He contended that the law is in keeping with former supreme court rulings bearing on similar cases.

The opening argument for Maryland was made by E. S. Stockbridge, who was followed by Attorney Yellott, for the District, who contended that it is the right of all citizens to go where they please by any proper means of transportation without being subjected to any tax. The argument extended over 2 days and was closely followed by the court.

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Fight Anti-Glare Ordinances

PHILADELPHIA, PA., Nov. 7—Automobile headlights are prohibited in Fairmount Park after November 15, the Park Commissioners having issued an announcement to that effect. The question of the responsibility of car drivers in cases of accident caused by the use of only dim side lights has been raised by frequent users of the park drives, who, in opposing enforcement of the new regulation, claim that the dangers of collision will be more numerous than ever before. At a meeting of the Quaker City Motor Club in the Hotel Walton President Huyette appointed a committee to make observations at night in the various driveways in the park as to conditions existing along poorly lighted roadways, and have the data presented to the Park Commissioners with a view to having the order modified to permit searchlights on certain driveways as being necessary to the safety of the public.

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SEATTLE, WASH., Nov. 14—Motor car owners of Seattle, backed by the Automobile Club of Seattle, have started a fight on the anti-dazzling headlight law recently put into effect in this city. The ordinance prohibits glaring headlights of any kind within the city limits, the district not being confined to the business section. As a result of the law a number of accidents have occurred in the residence districts.

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DENVER, COL., Nov. 13—About 200 motorists have been summoned into police court during the last week to explain their failure to meet the requirements of the new law prohibiting glaring headlights. Many others have been stopped and warned by the police.

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ST. LOUIS, MO., Nov. 14—Joseph L. Norris, a chauffeur, was convicted of "felonious wounding" and sentenced to a year in the St. Louis Workhouse. This was the first conviction by a jury on the charge which became a local law about 2 years ago. Norris ran over and injured a 9-year-old boy 3 months ago, and witnesses testified he was driving his machine at about 25 miles an hour and that he did not sound an alarm. After striking the boy the car ran about 250 feet before Norris could bring it to a standstill.

Floating Axle Patents in Suit

Patent-Holding Company Alleges Car Maker Infringes—N. A. C. C. May Take Hand

CHICAGO, Nov. 11—Suit was begun here today in the United States district court before Judge Landis by the Kardo Co., Cleveland, against the Studebaker Corp., Detroit, alleging infringement by five patents which the Kardo Co. holds and which the suit alleges that the Studebaker cars infringe. The major patent in this suit is that of a floating axle construction, one of the patents which the Kardo organization controls. This patent was originally issued to Louis P. Mooers, and has been re-issued with some additional claims. It covers rear axle construction in which the drive shafts of the axle can be withdrawn and further in which the differential unit can be adjusted with reference to driving pinion on the rear of the propeller shaft.

It has been anticipated for some time that the Kardo company would sooner or later begin suit against some of the motor car manufacturers, although no information was given as to against what company the suit would be filed. Since its organization some months ago the Kardo company has made many overtures to car manufacturers with the apparent intention of having them take out licenses to build axles on a royalty basis. Up to this date none of the manufacturers have taken licenses. The license arrangements offered to some companies were on a royalty basis of $2.50 per car, this to cover the Kardo patents so far as referred to rear axle construction. This figure was reduced according to the quantities in which cars were to be manufactured.

Chamber of Commerce May Fight

It is anticipated that the National Automobile Chamber of Commerce will take up the fight of this patent against the Kardo company, although no official announcement has been made to this effect. The N. A. C. C. has, through its legal and patent departments, been conducting an exhaustive investigation on the Kardo patents, and it is expected that this report will be furnished soon. The N. A. C. C. has during its existence aimed at reducing patent litigation to the minimum, and with this object in view purchased for the protection of its members the cork insert patent governing the use of cork inserts in clutches and brakes, and more than 2 years ago purchased for the protection of its members privileges under the Dyer patents governing sliding gear transmissions in motor cars. Up to this time it appears that the Kardo company has not made any advances towards the national body with reference to the patents it controls.

The N. A. C. C. today issued the following official statement regarding the present suit against the Studebaker Corp.

Official Statement Issued

"Officials of the National Automobile Chamber of Commerce believe that makers as a unit are opposed to any effort on the part of the Kardo Co. to extract tribute from the automobile industry on the eight or nine patents which it has secured from inventors with a view solely to secure revenue and not with the thought of protecting its product.

"The N. A. C. C. has made a comprehensive search in preparation for any aggressive movement of the Kardo company and from expressions of the members and directors it would appear that the entire industry is united to support any of its members that are attacked and to defend them in every way. The ablest counsel has been retained for this purpose, including Frederick P. Fish, of Fish, Richardson, Herrick & Neave, Boston, Mass.

"There are ninety-three motor car makers in the N. A. C.C. who have looked with disfavor upon the incorporation and purposes of the Kardo company, which was formed as a patent-holding company of an offensive nature, with a view to demanding royalty from motor car builders, which counsel has declared are of doubtful validity, and the payment of any royalties on which would be of no benefit whatever to the inventors. At this stage of the industry, with manufacturers endeavoring to give as great value as possible in automobiles, they do not feel that an additional royalty charge against the public is desirable."

Readers of THE AUTOMOBILE will recall that the Kardo company was incorporated some months ago by representatives of three companies, the Peerless Motor Car Co., Cleveland, the American Ball Bearing Co., Cleveland, and the Packard Motor Car Co., Detroit.

The patents involved in the Studebaker suit are:

No. 705,304 to C. T. Brock Sangster, July, 1902.
No. 753,168 to Walter C. Baker, February, 1905.
No. 792,690 to Alanson P. Brush, June, 1905.
No. 832,991 to L. P. Mooers, October, 1906.
No. 1,013,450 to Chas. Schmidt, January, 1912.

Of these patents that of Louis P. Mooers was assigned to the Peerless company; that of Mr. Brush to the Baker Motor Vehicle Co., and that of Chas. Schmidt to the Packard company.

The present action claims that these are all infringed by the Studebaker Corp. It is supposed that the Studebaker case will be a test one, although there are no indications that the Kardo company may not begin suit against other manufacturers.

The most important patent of the group is the Mooers one, which provides for a floating axle construction, with removable axle drive shafts and adjustments between the differential driving member and the driving pinion on the propeller shaft.

The Schmidt patent refers to a rear axle type of gearset at present used by the Packard company.

The Brush patent relates to the mounting of the differential and driving pinion of the rear axle for adjustments.

The Baker patent refers to a bevel gear rear axle in which adjustments can be made in connection with the differential without opening the housing.

Hand Horn Claim Is Sustained

WASHINGTON, D. C., Nov. 14—A new factor was injected into the present patent litigation on hand-operated horn when the Board of Appeals in the Patent Office affirmed a decision made by the patent examiner that Emanuel Aufiero is entitled to his claims on the flywheel construction in hand-operated horns and that G. F. Long, who was granted a patent on this construction, is not. Mr. Aufiero is connected with the engineering department of the Automobile Supply Mfg. Co., to which company his patents belong. According to Patent Office procedure Mr. Long has until December 4 to take an appeal to the Commissioner of Patents in the case.

The flywheel construction in hand-operated horns refers to the use of a heavy flywheel which is started to rotate when the horn handle is operated. Once this flywheel is rotating it will continue for some time, due to its weight. The rotation of the flywheel accomplishes the vibration of the diaphragm.

In the present case Mr. Long was granted a patent, No. 1,090,080, last March, embodying this form of construction, but it now appears that the patent examiner has ruled that Aufiero's claims are valid and not Long's. Mr. Long's patent is assigned to the Gottfried Piel Co.

Bosch Denies Magneto Patent Infringement

NEW YORK CITY, Nov. 16—The Bosch Magneto Co. has filed its answer to the bill of complaint filed against it by the Splitdorf Electrical Co. charging infringement of patent No. 1,074,416, and denies infringement, averring that the patent in suit is invalid.

The Bosch company admits that the patent was duly issued to John M. Dinkins, Franklin B. Hays and William L. Taylor, all of Indianapolis, Ind., September 30, 1913, but denies that the patent is valid and that it was granted in accordance with the then existing statutes of the United States. It further denies that it has infringed or threatened to infringe said patent and that it has received any gains or profits by any infringement of the patent or that it has caused the plaintiff any damage. The defendant further claims that John M. Dinkins and Franklin B. Hays were not the original inventors of any material part of the thing patented, but that every part thereof was in use prior to the alleged invention or more than 2 years prior to the application for the patent. In proof of this assertion the defendant cites French patent No. 342,209 to Adolph Clement and Marcel Masson; French patent No. 357,769 to Rudolf Rickmann; German patent No. 170,055 to Josef Gawron; German patent No. 45,161 to Paul Winand, and *The Automotor Journal*, Vol. 12, No. 20, pages 667, 668 and 669.

Asserts Prior State of Art

The Bosch company also asserts that the state of the art of magneto ignition systems at or before the time of the alleged invention of the patent was such that there was nothing new or patentable in such an alleged invention and that, therefore, this invention was not patentable under the laws of the United States. The defendant declares that it is ready and willing to prove this state of the art. The Bosch company submits to the court that the plaintiff has no right

to any further answer to its bill of complaint or any part thereof, and it prays for dismissal of the suit.

The patent in suit, No. 1,074,416, as stated in THE AUTOMOBILE for November 5, covers means in a magneto ignition system for changing the polarity of the armature to coincide with the polarity of an external current during the time that the primary winding on the armature is coupled with the external source of current. The object of this system is to use a battery and a coil in connection with the primary winding of the magneto to produce a sufficient current for ignition purposes for easy starting at low cranking speeds. This is commonly known as a duplex system.

The suit is brought in the United States district court for the southern district of New York.

Ford Increases Surplus by $20,702,859.39

Total Surplus Is Now $48,827,032.07—Liquid Assets Increase Over 100 Per Cent in Past Year—Cash on Hand $27,000,000

DETROIT, MICH., Nov. 13—The Ford Motor Co., during its fiscal year ending December 30, 1914, increased its surplus over $20,000,000, the actual figures being $20,702,-859.39. The company started its fiscal year with a surplus of $28,000,000, so that this added to the profits of the present year gives the company a present surplus of $48,827,-032.07.

During the year, the liquid assets of the company have increased more than 100 per cent, liquid assets being meant cash on hand and accounts receivable. A year ago the cash on hand was over $13,000,000, today it is over $27,000,000. Last year the accounts receivable were half a million, this year they are over $3,000,000, a fact no doubt explained by the great increase in the number of accounts during the past year.

Factory Values More Than Doubled

But during the year other aspects of the Ford business besides the liquid assets have shown enormous increases. Factory values have more than doubled. A year ago, the buildings and building fixtures were estimated close to $4,500,000. This year they are nearly $10,725,000. These figures are not exactly accurate, the actual ones being given on the balance sheet being reproduced herewith.

Looking at the real estate aspect of the company, it has shown a very healthy growth during the year, increasing from $1,500,000 to $2,225,000. The factory equipment has increased from a little over half a million to one and one-half million. The investment in machinery has risen from $2,000,000 to nearly $4,000,000.

The present surplus of nearly $49,000,000 is not only the biggest among all the automobile manufacturers of the world but one of the biggest among all industrial or manufacturing concerns in the United States. It is all the more conspicuous because during the past 9 months of the fiscal year the profit-sharing system of the factory has been in operation, 82.5 per cent. of the employees sharing in this plan.

When the vice-president of one of Detroit's oldest banks was asked to what he attributes the remarkable financial showing of the Ford company, he said, without allowing his name to be quoted: "Not only is the Ford company the most conspicuous automobile factory in the country, but it has one of the greatest business organizations in the world. To be able to make the showing it has just announced, when business conditions the world over have been none too good for many months and with the installation of the profit-sharing plan, which turns into the pockets of the employees a very important part of the profits, the company must have not only captains of industry but of finances, men such as there are few to be found in our days, who know how to run a big business end and not only from the manufacturing end. That is what is lacking in all industries; men with sound business judgment, men who will not risk, who will not take too big a chance and ruin a concern to fulfil their ambition. In the automobile business this has been in most cases the cause of many concerns going to the wall."

Big Success on Specialization

Although the Ford Motor Co. started in business in June, 1903, it is only since 1908, when the policy of manufacturing only one chassis was put into effect, that the success of the company started on a scale which until then was entirely unknown in the automobile world. An official of the company stated that if the old policy of building several types of cars, fours and sixes, with chassis of various sizes, had been maintained that the Ford company would not have been able to become the big concern it is to-day.

The general outlook of business is satisfactory to the Ford officials. Conditions throughout the country are reported to be greatly improved over what they were several months ago.

In three years the total assets of the company have almost tripled, totaling $20,815,783.63 in 1912, $35,033,919.86 in 1913 and amounting to $61,632,257.16 in September, 1914.

The total of the surplus for the last three years was near the hundred million mark last September, the exact figures being $91,696,301.32.

FORD BALANCE SHEET

Assets	1914	1913	1912
Cash on hand and in banks	$27,441,468.79	$13,225,710.82	$ 6,400,100.66
Michigan municipal bonds at cost	1,330,546.84	1,283,943.59	1,075,051.48
Accounts receivable	3,233,582.73	448,233.93	230,912.17
Merchandise inventory at cost	9,284,449.26	9,046,171.68	6,629,533.83
Outside investments	9,200.00	7,433.32	7,772.04
Prepaid expenses	437,089.77	215,259.29	44,591.07
Real estate	2,227,567.88	1,540,483.42	820,636.97
Buildings and building fixtures	10,714,928.45	4,615,156.82	2,596,115.61
Factory equipment	1,661,155.23	676,589.49	371,110.90
Furniture and fixtures	105,263.95	77,357.60	58,059.39
Machinery and power plant	3,821,465.38	2,832,907.33	1,843,967.02
Tools	1,199,779.11	824,901.04	566,510.17
Patterns	105,992.30	92,710.13	66,884.06
Patents	59,767.47	57,224.27	51,793.96
Machinery, tools and equipment at branches	.....	89,837.13	52,746.30
	$61,632,257.16	$35,033,919.86	$20,815,785.63

Liabilities	1914	1913	1912
Accounts payable	$3,335,139.01	$3,049,586.86	$2,261,026.63
Contract deposits	1,452,622.82	.....	.....
Accrued pay rolls	537,489.70	191,940.70	149,166.45
Accrued salaries	44,229.95	24,169.30	12,327.45
Accrued expenses	218,140.50	266,119.43	178,766.10
Contract rebates	621,381.12	25,960.00	58,350.00
Reserve for depreciation of fixed assets	1,935,440.07	1,061,805.25	742,626.89
Reserve for depreciation of patents	59,767.47	57,224.27	51,793.96
Fire insurance reserve	43,934.45	34,059.63	11,900.40
Reserve buyers profit-sharing	2,557,080.00	.....	.....
Reserve for employees' bonus	.....	134,999.96	242,033.80
Reserve for bad debts	.....	3,510.55	3,655.04
Reserve for unearned profits—branches	.....	60,370.23	284,043.34
Reserve for refunds to take care of reduction in price	.....	.....	75,000.00
Capital stock	2,000,000.00	2,000,000.00	2,000,000.00
Surplus	48,827,032.07	28,124,173.00	14,745,095.57
	$61,632,257.16	$35,033,919.86	$20,815,785.63

Reo Ends 1914 Season—Big Gains

LANSING, MICH., Nov. 14—Four days ago the Reo Motor Car Co. shipped the last of its 1914 models.

"This has been a big and good year," said sales manager R. C. Rueschaw, "and from all indications next year will be even better. All departments except the paint and trimming departments are working with their full force, which means that 1,800 men are at work. Just as soon as the necessary raw material is on hand the two other departments will be also working and then we will have a force of 2,200 men and women on the pay roll.

"Conditions have greatly changed in the automobile business. In years not so far distant the trade gradually dropped off from August to January, when the new season started. This year August, as far as we are concerned, was a bigger month than July, while September and October were very good indeed."

National conference of salesmen of Goodyear Tire and Rubber Co., held recently at the factory in Akron, O. There are 1,000 men in the picture;

To Make Armored Truck with Gun Turret

Will Mount Bodies Made by an Armor Plate Firm on Federal Truck Chassis

NEW YORK CITY, Nov. 17—For the purpose of turning out an armored truck mounting two machine guns in a revolving turret, the Armored Motor Car Corp. has been formed by J. H. Allen, 2 Rector street, this city, eastern representative of the Elyria Iron & Steel Co. It is incorporated for $6,000. Mr. Allen has a patent covering the application of the revolving turret to a motor truck.

The steel bodies will be built on contract and will be mounted on a 2-ton Federal chassis; the body will weigh 3,000 pounds, leaving a margin of 2,700 pounds for the two guns, operators and ammunition. The first car will be completed in about 3 weeks and will be displayed in the salesrooms of the Federal Truck Co., 146 West Fifty-second street.

Twelve chassis comprise the first order. The bodies will be made by an armor-plate company and shipped to the Federal plant in Detroit where they will be mounted on the chassis. The vehicles will be manufactured for the United States government as well as for governments of foreign countries.

Counselman Retires from Active Service

DETROIT, MICH., Nov. 14—Lee Counselman, who has been vice-president and general manager of the Chalmers Motor Co. during the last few years, has retired from active service. Lee R. Olwell, who was assistant general manager, is now general manager, and Treasurer Clarence A. Pfeffer has been made assistant general manager and continues as treasurer. Mr. Counselman continues his connection with the Chalmers company as one of the vice-presidents and a member of the board of directors.

S. A. E. Standards Committee in Session

NEW YORK CITY, Nov. 18—With more than thirty-five in attendance the convention of the standards committee held in the rooms of the Society of Automobile Engineers opened yesterday. The work scheduled for the 3 days' session includes the reports of fourteen divisions as listed in THE AUTOMOBILE for November 5, page 864.

The schedule for yesterday called for the reports from the divisions on commercial car wheels, truck standards, motor testing, electrical equipment and miscellaneous fittings. Reports were submitted and the work outlined for the remaining period before the annual meeting of the society which takes place January 6 and 7 at the Engineering Societies Building in this city.

The custom of advancing mileage to the members of the standards committee from out of town was inaugurated at this meeting and the result was an augmented attendance. Those attending on the first day of the conference were the following:

Joseph Bijur, Bijur Motor Lighting Co.; Leonard Kebler, Ward Leonard Electric Co.; R. J. Nightingale, Willard Storage Battery Co.; Henry Souther, Ferro Machine and Foundry Co.; Alexander Churchward, Gray & Davis Co.; Russell Hoopes, Hoopes Bros. & Darlington; H. G. Osburn, National Metal Molding Co.; R. L. Morgan, Consulting Engr.; H. H. Buswell; Henry B. Coleman, F. S. Lee; Chester E. Clemens, Perfection Spring Co.; C. B. Williams, Mott Wheel Company; Alden McMurtry, Consulting Engr.; J. G. Perrin; R. S. Bryant, Standard Welding Co.; C. J. Welch, U. S. Tire Co.; A. H. Ehle, Baldwin Locomotive Works; W. P. Kennedy, Consulting Engr.; R. McA. Lloyd; C. T. Meyers, Mechanical Engr.; T. V. Buckwalter, Pa. R. R.; E. R. Whitney, Commercial Truck Co.; W. H. Conant, Gould Storage Battery Co.; W. S. Gould; H. W. Harper, Howard Miniature Lamp Co.; C. M. Bunnell, Edison Lamp Works; H. D. Church, Packard Motor Car Co.; V. G. Apple, Splitdorf Electrical Co.; A. D. Libby, Splitdorf Electrical Co.; B. B. Bachman, Autocar Company; and J. J. Aull, Lunkenheimer Co.

Metropolitan S. A. E. To Discuss Eights

NEW YORK CITY, Nov. 18—At the monthly meeting of the Metropolitan Section of the Society of Automobile Engineers, to be held at the Automobile Club of America, November 24 at 8 p. m., the subject of eight-cylinder motors will be discussed.

A paper on this will be presented by D. McCall White, the designer of the Cadillac eight and a number of engineers prominent in the trade have been invited to take part in the discussion following the presentation of the paper. Preceding the meeting there will be an informal dinner at the Automobile Club of America.

Miller Rubber Earns 10 Per Cent. on Common

AKRON, O., Nov. 13—Stockholders of the Miller Rubber Co. today re-elected the retiring officers. General Manager W. F. Pfeiffer's report showed sales for the past year exceeding $2,500,000. The net profits amounted to $528,000, sufficient to pay 7 per cent. on the preferred and 10 per cent. on the common stock, and allowing for depreciation on buildings, machinery and tools and crude and finished products.

The officers are as follows: President, Jacob Pfeiffer; vice-president, C. T. Grant; treasurer, F. B. Theiss; secretary and assistant treasurer, W. F. Pfeiffer. They, with J. M. Doran, comprise the board of directors.

Fighting Financial Problems

DAYTON, O., Nov. 17—Upon the application of J. I. Baker, president and general manager, T. W. Baker was appointed receiver for the Dayton Electric Car Co., of this city. The company has been manufacturing electric automobiles for some time.

President Baker claimed that he was surety on notes aggregating $20,000, of which $19,000 was past due, and since other creditors were demanding payment it was thought best to petition for a receiver. He declared that the assets would not be sufficient to meet all of the claims against the company if an attempt were made to do business as formerly. The company has a large number of electric automobiles, buggies and carriages on hand. A request has been made to sell the property and distribute the proceeds.

MILWAUKEE, WIS., Nov. 9—The Universal Machinery Co., 1916 St. Paul avenue, Milwaukee, formerly a producer of

550 salesmen, branch managers, etc., including part of the Canadian organization; the remainder are members of the reception committee

Universal motor trucks and more recently a builder of small gasoline engines for motorcycle, cyclecar and light car purposes, has filed a voluntary petition in bankruptcy. The assets are given as $68,352 and liabilities as $59,957 at the present time.

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Crescent Motor Liabilities $485,590.32

CINCINNATI, O., Nov. 14—Listing liabilities at $485,590.32 and assets at $428,968.45, the Crescent Motor Co., bankrupt of this city, yesterday, through its president, W. T. Hunter, filed its schedules in bankruptcy in the United States District Court.

The plant of the company is located at Carthage, where it occupies a 10-acre tract. This is listed as having a value of $170,445. It is the main item in the assets. The stock on hand is appraised at $159,159 and the machinery at $68,044. Other personal property belonging to the company is listed as worth $22,425, and the debts due to the company aggregate $5,865.

The secured debts amount to $211,126 and the unsecured to $189,604, while there is liability also on bills and notes of others to the amount of $82,794.

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DETROIT, MICH., Nov. 17—The Detroit Electrical Appliance Co., manufacturer of Deaco starters, was adjudged bankrupt on November 16 in the Federal Court, this city. Schedules have not been filed.

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PORT HURON, MICH., Nov. 16—The Havers Motor Car Co., this city, was today adjudged bankrupt in the Federal Court, Detroit, Mich. Schedules have not been filed.

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DETROIT, MICH., Nov. 17—An added 4 per cent. dividend, making a total of 45 per cent., is to be paid creditors of the Grabowsky Power Wagon Co. This will total about $880,000. Also, another 3 or 4 per cent. dividend is in prospect.

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Overland Adds 17 Acres of Floorspace

TOLEDO, O., Nov. 18—*Special Telegram*—Although additions to the plants of the Willys-Overland Co., embodying 25 acres of floorspace have just been completed. It is announced today that two additional buildings will immediately be erected. The first of these, which is believed will be one of the largest factory buildings ever constructed, will be 1,000 feet long and 200 feet wide and have two stories and basement. The other will be 200 feet square. The additional floorspace will approximte 17 acres, swelling the total at the Toledo plants to 79 acres. With these additions Overland will have the largest aggregate space of any motor car plant in the world, it is claimed.

The largest of the new structures will be devoted to painting and upholstering departments and repairs and body assemblies. The other addition will join on to the just completed body assembly and machine work plant which now measures 200 by 400 feet, and therefore the latter is scheduled for an enlargement of 500 per cent. Reasons given for these tremendous additions are only that the growing demand has required the expansion. October was the biggest month the concern ever experienced, the sales representing more than $5,000,000. It is interesting to note that the largest of the above additions will have an area more than twice as great as that of the entire original Toledo factory when it was purchased by John N. Willys a little over 5 years ago.

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Curb Market Opens with Renewed Activity

NEW YORK CITY, Nov. 16—Renewed activity, with considerable strength here and there, characterized the official resumption of trading in the curb market today. The curb market, however, was unofficially opened on November 12. Most of the securities were fairly steady. Kelly-Springfield tire retained its firmness, selling at 52 and 53, as compared with the previous day's high of 53. A market was established for Willys-Overland common stock at 68 and 70, but no sales in this issue were reported. Transactions in Maxwell Motors common stock took place at 14 and 14¼, off, in the last case, ¼ point from the close. Trading in Standard Oil issues today was in moderate volume, with price changes erratic. Vacuum oil was steady at 180 and 185.

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Market Reports for the Week

Few changes occurred in this week's market reports. Those that did occur were mostly in the metal markets and were unimportant, with the exception of lead which went up $0.20 per 100 pounds, closing at $3.70. This product was very strong at the closing. The American Smelting & Refining Co. advanced the prices 10 points for shipment from the West in 50-ton lots. There were few customers to be found on Tuesday for copper. Electrolytic has been selling at higher prices with considerable buying at the early part of the week. But on Tuesday, few buyers could be found and the tone was less strong and prices more or less nominal after the feverish excitement and large sales. Tin was dull and lower with scarcely any demand even for nearby positions. There were no changes in the oils and lubricants markets.

Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Changes
Antimony	.13½	.13½	.13½	.13½	.13½	.13½	.....
Beams & Channels, 100 lbs.	1.21	1.21	1.21	1.21	1.21	1.21	.....
Bessemer Steel, ton	18.50	18.50	18.50	18.50	18.50	18.50	.....
Copper, Elec., lb.	.11 3/10	.11 7/20	.11 3/5	.11 5/8	.11 5/8	.11¾	+ .00 9/20
Copper, Lake, lb.	.11 3/5	.11 9/20	.11½	.11 5/8	.11¾	.11 7/8	+ .00 19/40
Cottonseed Oil, bbl.	5.30	5.30	5.35	5.38	5.30	5.20	—.19
Cyanide Potash, lb.	.25	.25	.25	.25	.25	.25	.....
Fish Oil, Menhaden, Brown	.40	.40	.40	.40	.40	.40	.....
Gasoline, Auto, bbl.	.13	.13	.13	.13	.13	.13	.....
Lard Oil, prime	.90	.90	.90	.90	.90	.90	.....
Lead, 100 lbs.	3.50	3.60	3.60	3.60	3.60	3.70	+.20
Linseed Oil	.47	.47	.47	.47	.47	.47	.....
Open-Hearth Steel, ton	18.50	18.50	18.50	18.50	18.50	18.50	.....
Petroleum, bbl., Kans, crude	.55	.55	.55	.55	.55	.55	.....
Petroleum, bbl., Pa., crude	1.45	1.45	1.45	1.45	1.45	1.45	.....
Rapeseed Oil, refined	.73	.73	.73	.73	.73	.73	.....
Rubber, Fine Up-River, Para	.65	.65	.63	.63	.63	.67	+.02
Silk, raw, Ital.	..	4.10	..	..	4.10	..	.....
Silk, raw, Japan	..	3.15	..	..	3.15	..	.....
Sulphuric Acid, 60 Baume	.90	.90	.90	.90	.90	.90	.....
Tin, 100 lb.	34.00	33.75	33.50	33.00	33.25	32.75	—1.25
Tire Scrap	.05	.05	.05	.05	.05	.05	.....

Official Time of Marmon 41 in Tests

Miles	Lap Time	Lap M.P.H.	Elapsed Time	Aver. M.P.H.
2.5	2:23.52	62.8	.....	...
5.0	2:23.88	62.6	4:47.40	62.6
7.5	2:24.09	62.5	.....	...
10.0	2:23.50	62.8	9:34.99	62.7
12.5	2:23.15	62.9	.....	...
15.0	2:23.06	62.9	14:21.20	62.8
17.5	2:24.14	62.4	.....	...
20.0	2:24.62	62.2	19:09.98	62.6
22.5	2:22.52	63.2	.....	...
25.0	2:23.45	62.8	23:55.95	62.8
27.5	2:23.15	62.9	.....	...
30.0	2:23.92	62.5	28:43.02	62.7
32.5	2:22.89	63.0	.....	...
35.0	2:23.80	62.7	33:28.71	62.8
37.5	2:22.56	63.2	.....	...
40.0	2:23.53	62.8	38:13.80	63.4
42.5	2:22.29	63.4	.....	...
45.0	2:22.60	63.2	42:58.69	62.9
47.5	2:23.84	62.7	.....	...
50.0	2:23.24	62.8	47:44.77	62.85
52.5	2:22.87	63.1	.....	...
55.0	2:22.40	63.3	52:30.04	62.9
57.5	2:22.01	63.4	.....	...
60.0	2:22.66	63.2	57:14.71	62.9

Marmon 41 Makes 62.89 Miles in 1 Hour

Stock Touring Car with Five Passengers and Top Up Electrically Timed

INDIANAPOLIS, IND., Nov. 12—A Marmon Model 41 registered stock touring car traveled 62.89 miles in 1 hour on the Speedway today, carrying five passengers, and having top and windshield up. The test was under sanction of the American Automobile Association, and was directly supervised by F. E. Edwards, technical representative of the Contest Board, and C. S. Ricker, Speedway representative. The timing was recorded electrically.

This speed will constitute new stock car records in America for a car with five people and weighing with load 5,310 pounds and without load 4,570 pounds. The wind-resisting area of the car measured 40.8 square feet. The motor is a six-cylinder one, 4 1-4 by 5 1-2 and during the test it was operating at a crankshaft speed of 2,032.9 revolutions per minute. The gear ratio in the rear axle was 3.46 to 1 and 36-inch tires were used.

In addition to the test constituting a new record for 60 miles, the records are also claimed for intermediate distances and application made to the Contest Board of the A. A. A. for formal declarations of these records. The intermediate records are:

Distance	Time	M.P.H.
10 miles	9:34.99	62.7
20 miles	19:09.98	62.6
30 miles	28:43.02	62.7
40 miles	38:13.80	63.4
50 miles	47:44.77	62.85
60 miles	57:14.71	62.9

After the test was completed the engine was dismantled for the purpose of determining to what extent the parts had worn, the report simply stating that no appreciable wear of parts was disclosed.

—

Speedway Wants 1,000-Mile Fuel Test

INDIANAPOLIS, IND., Nov. 14—The Indianapolis Motor Speedway has applied for an A. A. A. sanction for November 18 and 19 to conduct a 1,000-mile test on a gasoline substitute known as synthetic fuel and which was recently tested in this city. The test is to be 500 miles each day and will be conducted by A. A. A. officials. The new fuel, it is claimed, can be manufactured at 2 cents a gallon, and is the invention of John Andrews, McKeesport, Pa. At the recent test in July a six-cylinder National, weighing 3,800 pounds, made 12.5 miles on a gallon of this fuel, in contrast with 15.2 miles per gallon of 64 gravity gasoline. In similar tests a Marmon six made 12.2 miles per gallon on the synthetic fuel, and was later run 100 miles on the road after which the valves did not show any special carbonization.

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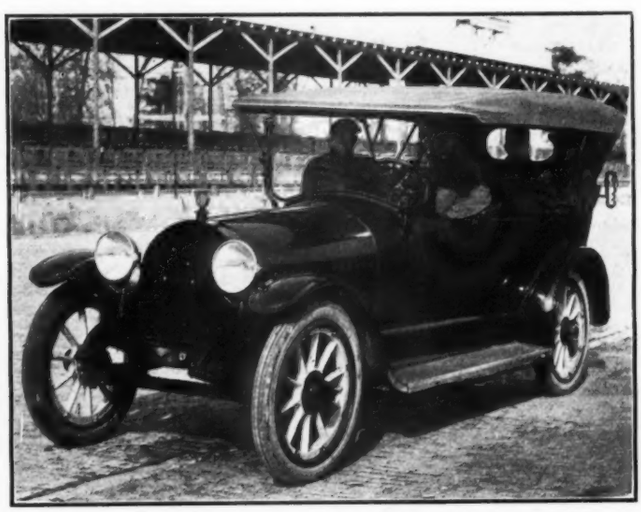
Earl Cooper Stars at Phoenix Track

PHOENIX, ARIZ., Nov. 16—Earl Cooper, winner of the Corona road race, was the star of the race meet held at the Arizona fair grounds track Thursday, November 12. Cooper and his Stutz won the principal event of the day, the 50-mile, in 47:59. The previous 50-mile record for an Arizona track was 50:53, set by Teddy Tetzlaff in his Fiat Cyclone a year before.

Barney Oldfield and the Cyclone were leading in the 27th mile, when a broken water connection put Oldfield out of the race. From that time on it was a struggle between Cooper and Art Klein, in the King. Each made one stop for tires. The little Maxwell, driven by W. W. Carlson, went to the finish without a stop but finished on one flat tire. These were the only cars to finish. Oldfield's Stutz, driven by George Hill, went out in the first 5 miles. Klein's time was 48:13 and Carlson's, 53:05.

There were two events exclusively for the cars that participated in the road races from Los Angeles and El Paso, and Oldfield won both easily. His time for the 15-mile event open to all cars that participated in the desert races, was 14:54. Jack Smith, Buick, was second in 15:05; Hugh Miller, Pope, third, 15:21 2-5; Lew Gasser, Stutz, fourth in 15:22 3-5. All except Oldfield were in the race from El Paso.

The race for cars finishing first and second in the desert races was limited to 5 miles. Oldfield was first in 4:59; Hugh



Marmon 41 stock touring car which made 62.89 miles in 1 hour in official tests held at Indianapolis Speedway. Note five passengers and top and windshield raised

Electrical timing device used in Marmon 41 trial. Left to right, officials are: F. E. Edwards, A. A. A.; C. S. Ricker, Speedway; Theodore Myers, Timer; H. E. Glover, assistant

Winning the El Paso-Phoenix race. Miller's Pope-Hartford with Ed. Orr driving crossing the line

Miller, Pope, second; John Hutchins, Buick, third; Louis Nikrent, Paige, fourth. The summary:

50-MILE

Car	Driver	Time	Car	Driver	Time
Stutz	Cooper	47:59	Maxwell	Carlson	53:05
King	Klein	48:13			

15-MILE

Car	Driver	Time	Car	Driver	Time
Stutz	Oldfield	14:54	Pope-Hartford	Miller	15:21⅘
Buick	Smith	15:05	Stutz	Gasser	15:22⅗

5-MILE FOR CARS FINISHING 1 AND 2 IN DESERT RACE

Car	Driver	Time	Car	Driver	Time
Stutz	Oldfield	4:59	Buick	Hutchins	——
Pope-Hartford	Miller	——	Paige	Nikrent	——

Pope-Hartford Won El Paso-Phoenix at 50 M.P.H.

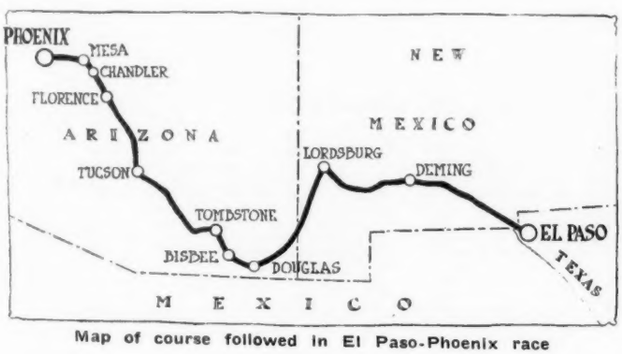
PHOENIX, ARIZ., Nov. 13—It was at over 50 miles an hour and with one rear wheel wobbling about on cracked and splintered spokes that Ed. Orr in Hugh Miller's Pope-Hartford finished winner of the El Paso-Phoenix race, as reported in THE AUTOMOBILE for November 12. He had no engine trouble and changed only two tires in the 533 miles but his car turned turtle on a sharp curve 12 miles west of Bisbee, the night control, throwing Orr and Miller out and cracking the spokes in a rear wheel. The car was righted with poles and won the race.

J. T. Hutchins, who finished second in a Buick, had little trouble but changed tires several times. Tom Brewer, who drove a Marmon to third place, changed twelve tires and those on which he finished were worn through the fabric. Fourth place went to L. E. Cornu, whose Palmer-Singer went out at Lanark, N. M., with engine trouble, and who finished in a Stutz. Of the twenty-seven starters, only ten reached Phoenix. Nine went out the first day.

Winners Divide $5,600 Purse

The four winning cars divided a purse of $5,600, the Pope-Hartford, first, taking $2,800; the Buick, second, $1,400; Marmon, third, $840; and Stutz, fourth, $560. In addition, the cities of Bisbee and Tucson gave $1,000 and $500, respectively for the cars making the best time to these points. The Pope-Hartford and the Buick took first and second places straight through. Brewer's Marmon was third at Phoenix and Bisbee. Cornu's Stutz was fourth at Phoenix, third at Bisbee and fourth at Tucson. Leonard's Buick was fourth at Bisbee.

The times of the winning cars were: Pope-Hartford, 14:35:48; Buick, 15:57:01; Marmon, 16:37:28; and Stutz, 16:41:34. The average time of the winner was 37.3 miles per hour.



Map of course followed in El Paso-Phoenix race

RUNNING TIMES IN EL PASO-PHOENIX RACE

Car	Owner	Driver	Town	Running Time to Bisbee Night-Control	Running Time El Paso to Phoenix
Pope-Hartford	H. B. Miller	H. B. Miller	Phoenix	7:31:03	14:35:48
Buick	J. T. Hutchings	J. T. Hutchings	Alamogordo	8:09:14	15:57:01
Marmon	Tom Brewer	Mrs. W. G. Shanley	Globe, Ariz.	8:48:00	16:37:28
Stutz	S. W. Sales Co.	L. E. Cornu	El Paso	8:21:22	16:41:34
Mitchell	J. F. Heimback	C. G. Miller	Tuscon, Ariz.	9:02:19	17:34:15
Stutz	Crowl & Gasser	Lou Gasser	El Paso	9:32:26	20:40:56
Halladay	D. F. Deemer	D. F. Deemer	Las Cruces	11:13:45	20:53:05
Oldsmobile	G. V. A. Stage Co.	H. D. Thomas	Globe, Ariz.	9:52:22	21:13:07
Buick	W. G. Dunn	George Leonard	El Paso	8:37:03	Broke axle at Chandler. Arrived Monday night.
Ford	Tri-State Motor Co.	E. E. Wiseman	El Paso	10:10:41	Reached Phoenix Monday night.
Buick	J. C. Jones	H. A. Joseph	Tucumcari	9:22:29	Hauled in
Kissel	D. Moore	D. Moore	Tuscon	9:34:09	Out near Tucson.
Buick	Borderland Garage	Floyd Turner	Las Cruces, N. M.	8:57:14	Engine trouble near Empire Ranch.
Fiat	F. Ballard	Billy Adolph	Los Angeles	9:46:36	Engine trouble near Empire Ranch.
Velie	M. L. Naquin	M. L. Naquin	El Paso	9:49:03	Broke wheel near Empire Ranch.
Simplex	Horace Murphey	W. E. Deuel	El Paso	11:02:16	Broke down after leaving Tombstone.
Buick	Johnson Bros.	Johnson	Carizozo, N. M.	12:58:00	Withdrew after Bisbee.
Cadillac	W. A. Bradford	W. A. Bradford	Lowell, Ariz.	....	Broke down
Pope-Hartford	W. Tremaine	W. Tremaine	Phoenix	....	Hit wire fence out of Lordsburg.
Fiat	Tooley & McNary	Ray Harrell	El Paso	....	Engine trouble near Tombstone.
Metropole	C. Chesterfield	E. E. Cater	Morenci, Ariz.	....	Out at Rodeo
Ford	M. L. Miller	M. L. Miller	Douglas, Ariz.	....	Broke down near Douglas.
Buick	S. W. Carb. Co.	Jack Smith	Phoenix	....	Broke down near Douglas.
Beaver Bullet	C. F. Keene	C. F. Keene	Beaver Falls, Pa.	....	Driver taken ill.
Lozier	J. D. Bukey	R. E. Lester	El Paso	....	Engine trouble after Douglas.
Palmer-Singer	C. C. Rossi	Ben Turner	El Paso	....	Broke down.
American	Fred Fay	La Salle	Globe, Ariz.	....	Scratched.
Krit	S. W. Auto Sales Co.	R. Peak	El Paso	....	Scratched.
Buick	G. M. Dubois	L. J. Freeman	Phoenix	....	Out at start.

Importers' Salon January 2 to 9

More Exhibitors Expected Than Ever Before—More Accessories at N. Y. Show

NEW YORK CITY, Nov. 14—The Automobile Salon, as the exhibition of foreign built motor cars held annually in New York, is known, will be held January 2 to 9 in the Grand Ball Room of the Astor as heretofore.

The 1915 Salon will be conducted as usual by the Automobile Importers' Alliance, of which E. Lascaris is president, T. E. Adams, vice-president, and Stefan J. Kjeldsen, secretary. Mr. Kjeldsen, who managed this annual event for many years past, will again serve in the same capacity.

From present indications the 1915 Auto Salon promises to have a larger list of exhibitors and to be more of a success generally, than any of its predecessors. Many of the foreign automobile factories are continuing in operation, on government work, and they have been able to complete the special chassis and finished cars, which they began to build before the war started. These special jobs are comparatively few in number, and not adapted to army use, so that there will be no difficulty in getting them over in time for the show.

Providence Shows 44 Cars and 15 Trucks

PROVIDENCE, R. I., Nov. 14—Rhode Island's annual automobile show opened this evening at the State Armory, at Providence, and it was thronged by an eager crowd. There was much interest centered in such cars as the new eight-cylinder Cadillac, the Dodge car, the Briscoe, the small Peerless, the four-cylinder Stearns-Knight, the new Overland Six and the new five-passenger Hupmobile, all of which made their debut for show purposes in the East. The show will continue all next week. On Wednesday there will be a double attraction when the price is increased, for it will be combined Society day and Governor's night. Many of the Boston dealers are here to spend the week, and a large number of dealers who are located in Southern Massachusetts will be prominent at the various spaces.

The show is not wholly a passenger car exhibition, for in the basement there are fifteen different makes of trucks. Scattered about are thirteen different accessory dealers, making a total display of some seventy-two exhibits in the building.

Multibestos Men Hold Convention

FRAMINGHAM, MASS., Nov. 13—At the recent sales convention of the Standard Woven Fabric Co., of this city, manufacturers of brake lining, technical questions which came up in connection with brake-lining sales were covered by E. E. Waite, factory manager of the company, in his talk on "Multibestos Compared with Other Brake Linings." Mr. Waite took the representatives through the factory and explained each manufacturing process. He then gave the engineering data on a number of brake lining tests which he himself had made, and also of tests which had been made by several automobile manufacturers.

General Manager Burdick gave a talk in which he traced the history of this company's success. According to his report business has been doubled in the past year.

Although the convention was decidedly of a business nature there was also a social side. One evening was spent at the Framingham Country Club with Mr. Burdick as host.

Another convention is planned for January, when representatives from the Chicago and San Francisco offices will be present.

Dealers Organize Association in Boston

BOSTON, MASS., Nov. 14—The Massachusetts Automobile and Accessory Dealers' Assn. was formed in Boston today as a result of several meetings at which more than 100 dealers have aired their views on the trade in motor accessories. The new organization starts off with about seventy-five members and it is expected that this number will be doubled within a short time when the dealers in other cities can be brought in. George P. Brophy has been chosen president and Joseph Everett, secertary. At the next meeting a board of directors will be elected, and also other officers.

G. M. C. Directors and Officers Re-elected

DETROIT, MICH., Nov. 18—At the annual meeting of the General Motors Co., the retiring directors were re-elected. The directors re-elected the officers. The board of directors consists of Thomas Neal, chairman, Joseph Boyer, E. W. Clark, W. C. Durant, R. F. Herrick, J. H. McClement, E. D. Metcalf, C. S. Mott, M. J. Murphy, C. W. Nash, J. J. Storrow, Albert Strauss, N. L. Tilney and Jacob Wertheim. The officers are as follows: President, C. W. Nash; vice-presidents: E. W. Clark, W. C. Durant; secretary, Standish Backus; J. T. Shaw, treasurer; and comptroller, W. H. Alford.

Packard Paris Manager Sees Business Opportunity

DETROIT, MICH., Nov. 17—*Special Telegram*—Manager R. N. Goode, of the Paris branch of the Packard Motor Car Co., is here for a short business stay. He says business conditions are improving in France and England, and Paris business men who had left the city when the Germans were so near it, are now returning and reopening their stores. American manufacturers could do big business now in countries at war and they should receive assistance from the American government which should show them how to get that business. There is a very big waste of automobiles among the French because so many cars are driven by incompetent men.

Maxwell Representatives Meet in Detroit

DETROIT, MICH., Nov. 17—A convention at which sixty district representatives and salesmen of the Maxwell Motor Co., was held at the main offices of the Maxwell company yesterday and today. The men came from the Middle Western, Eastern and Southern states for the purpose of becoming more familiarized with the general Maxwell business methods and policy and get first hand knowledge about the construction of the Maxwell cars. Yesterday the visitors were given talks by Walter M. Anthony, comptroller of the Maxwell company, who spoke on financial matters; C. E. Stebbins, sales manager, who spoke on salesmanship; J. A. Vail, chairman of the board of directors, on business conditions, C. R. Newby, zone supervisor, on starting and lighting systems. Informally many other subjects were discussed. Today the zone or district supervisors conducted the men from their respective zones or districts through the factory acting as their guide and instructor.

NEW YORK CITY, Nov. 14—Applications for show space still continue to pour in on the National Automobile Chamber of Commerce for both New York and Chicago shows. Following is a list of those companies who secured space during the past week:

Additional Accessory Exhibitors for New York and Chicago Shows

AT BOTH SHOWS

Atlas Automatic Jack Corp.....New York City
Brown Trafilog Co.....Cleveland, Ohio
Curtis Pneumatic Mach. Co.....St. Louis, Mo.
Hydraulic Pressed Steel Co.....Cleveland, Ohio
Massnick-Phipps Mfg. Co.....Detroit, Mich.
A. J. Picard & Co.....New York City

NEW YORK

American Die & Tool Co.....Reading, Pa.
Ashley Steel Bldg. Co.....New York City
Atlas Automatic Jack Corp.....New York City
Auto Air Appliance Co.....Baltimore, Md.
Eugene Bournonville Welding Co..Cleveland, Ohio
Brown Trafilog Co.....Cleveland, Ohio
Curtis Pneumatic Mach. Co.....St. Louis, Mo.
General Rim Co.....Cleveland, Ohio
Gerhart Motorcycle Co.....Harrisburg, Pa.
Hydraulic Pressed Steel Co.....Cleveland, Ohio
Hydraulic Oil Storage Co.....New York City
Lane Bros. Co.....Poughkeepsie, N. Y.
Massnick-Phipps Mfg. Co.....Detroit, Mich.
Metal Specialties Co.....Chicago, Ill.
Micro Piston Ring Co.....New York City
A. J. Picard & Co.....New York City
W. S. Sheppard.....Newark, N. J.
Universal Car Equipment Co.....Detroit, Mich.

CHICAGO

Atlas Automatic Jack Corp.....New York City
Brown Trafilog Co.....Cleveland, Ohio
Currier-Koeth Mfg. Co.....Coudersport, Pa.
Curtis Pneumatic Mach. Co.....St. Louis, Mo.
Gould Storage Battery Co.....New York City
Hydraulic Pressed Steel Co.....Cleveland, Ohio
Massnick-Phipps Mfg. Co.....Detroit, Mich.
A. J. Picard & Co.....New York City
Positive Supply Co.....Davenport, Iowa

Factory Miscellany

FORD Plant for Buffalo — The Ford Motor Co., Detroit, Mich., has bought four large parcels of property in Buffalo, N. Y., extending northeasterly from Main street and the New York Central Belt Line, along Main street to Rodney street, to Halbert street, to within 150 feet of Jewett avenue. The property has a street frontage of over 900 feet and nearly 470 feet of frontage on the Belt Line. It is the intention of the company to build in the spring a four-story building on practically the entire site. The structure will be of reinforced concrete. It is estimated that the land, building and development of the site will represent an investment of fully $500,000.

Ward Co. Erecting—The Ward Motor Vehicle Co., Mt. Vernon, N. Y., will erect a factory 162 by 301 feet.

Blair Truck Adds—The Blair Motor Truck Co., Newark, O., will erect a factory building on Sixteenth street, Newark.

Davis Co.'s Plant—The A. R. Davis Motor Co., 2034 Euclid avenue, Cleveland, O., will erect a two-story plant, 50 by 170 feet.

Hess-Bright's Addition—The Hess-Bright Mfg. Co., Philadelphia, Pa., has just broken ground for a three-story addition to its plant, 38 by 200 feet.

Vulcanizing Products Co. Builds—The Haslop Vulcanizing Products Co., Johnstown, Pa., has purchased a site in Coopersdale, a suburb, and plans to erect a new plant.

Milwaukee Company Piston Maker—The Central Foundry Co., 705-723 Park street, Milwaukee, Wis., has established a department for the production of pistons, piston rings and cylinder castings.

Philadelphia Company Adds—The Auto Sales & Service Co., Philadelphia, Pa., will erect a two-story addition to its plant at Third and Chestnut streets.

Maher to Manufacture Accessories—The Maher Mfg. Co., Libertyville, Ill., will establish a plant for the manufacture of lighting fixtures and automobile accessories. N. L. Maher is interested.

Manhasset Co. Building—The Manhasset Mfg. Co., manufacturer of tire fabrics, Putnam, Conn., has begun the construction of a two-story addition to its plant having 10,000 square feet of floor space.

Will Manufacture Carbureters—Williams & Co., 58 Parks street, Niagara Falls, Ont., will install machinery for the manufacture of carbureters and complete equipment for general garage and automobile repairs.

Service Station in Burlington—The Lane Mfg. Co., Montpelier, Vt., the general distributor for the Cole car and the Kissel truck, will on December 1 open a branch salesroom and service station at Burlington, Vt. C. A. Niles will be in charge as sales manager.

Federal Employees' Club—A "Federal Rubber Goodfellowship Club" has been organized by the employees of the Federal Rubber Mfg. Co., Milwaukee, Wis., the purpose being to accumulate a fund which, about Christmas, will be used to bring good cheer into the homes of the needy.

Burnox Co. Carbon Remover Manufacture—The Burnox Co., West Allis, Wis., has been organized by Theodore Mueller, Paul Hunt and Charles E. Kubicek to manufacture and market a chemical compound for removing carbon deposits in internal combustion engine cylinders. Headquarters are in West Allis, Milwaukee county.

Overland Buys More Land—For the purpose of squaring a tract of land owned by the Willys-Overland Co., Toledo, O., back of Central Grove Park, that company has purchased a small strip, approximating about 1 acre. No immediate use is to be made of the purchase, but, like the tract to which it is to be attached, it is to be held for future development.

To Manufacture Valve Grinder—Forrest E. Devine, of Madison, Wis., inventor and patentee of a gang grinder for reseating valves in poppet-valve engines, by means of which all of the valves of a multiple-cylinder engine may be ground at one time, is preparing for a large production of the appliance, having secured the co-operation of one of the largest motor supply houses in Chicago in the direction of marketing the goods.

Auto Body Plant Nearly Completed—The Auto Body Co., Lansing, Mich., has nearly completed a new addition to its plant, the addition being for the purpose of housing the woodworking machinery and making it more convenient to caring for the rough timber stuff that is used in the manufacture of its bodies. The addition will give the company a plant a block long and with an L half a block long. The company has shown a remarkable growth in the decade elapsing since its organization on a capital of a few thousand dollars for the manufacture of automobile and buggy bodies.

The Automobile Calendar

Nov. 14-21	Providence, R. I., Show, State Armory, P. S. Clark, Mgr.
Nov. 16-21	Spokane, Wash., Show, Spokane Chamber of Commerce and the National Apple Show, Inc., G. C. Corbaley, Secretary.
Nov. 17-18-19	Harrisburg, Pa., Second Conference of Pa. Industrial Welfare and Efficiency, State Capitol.
Nov. 26	Corona, Cal., Road Race, Corona Auto Assn.
Nov. 26	Harrisburg, Pa., Economy Run, Harrisburg Motor Club.
Dec. 1-4	New York City, Annual Meeting of the American Society of Mechanical Engineers.
Dec. 12-19	Akron, O., Show, Akron Auto Show Co., O'Neill Bldg.
Dec. 14-18	Chicago, Ill., American Good Roads Congress.
Jan. 2-9	New York City, Annual Automobile Show, Grand Central Palace.
Jan. 2-9	New York City, Automobile Salon, Grand Ball Room of Astor Hotel, Automobile Importers' Alliance, E. Lascaris, Pres.
Jan. 3-10	Buenos-Aires, Argentina, Grand Prize of Argentina.
Jan. 9-16	Philadelphia Show, Metropolitan Bldg., Philadelphia Auto. Trade Assn.
Jan. 11-16	Buffalo, N. Y., Show, Broadway Auditorium, Automobile Club of America.
Jan. 16	Detroit, Mich., Show
Jan. 16-23	Cleveland, O., Show, Cleveland Automobile Show Co., F. H. Caley, Mgr.
Jan. 23-30	Chicago, Ill., Automobile Show, First Regiment Armory.
Jan. 23-30	Montreal, Que., Show, Allen Line Liverpool Bldgs., Montreal Automobile Trade Assn., T. C. Kirby, Mgr.
Jan. 25-30	Buffalo, N. Y., Show, Broadway Auditorium, Buffalo Automobile Dealers' Assn., J. J. Gibbon, Sec.
Jan. 30-Feb. 6	Minneapolis, Minn., Show, National Guard Armory, Minneapolis Automobile Trade Assn.
Feb.	Portland, Ore., Show, Portland Auto. Trade Assn.
Feb.	Toledo, O., Show, Toledo Auto Show Co.
Feb. 15-20	Omaha, Neb., Show, Auditorium, C. G. Powell.
Feb. 22	San Francisco, Cal., Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Feb. 23-27	Syracuse, N. Y., Show, Syracuse Auto. Dealers' Assn.; H. T. Gardner, Mgr.
Feb. 23-27	Ft. Dodge, Ia., Show, Armory, C. W. Tremain, Sec.
Feb. 27	San Francisco, Cal., Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 6-13	Boston, Mass., Show, Mechanics Bldg., Boston Auto Dealers Assn., Boston Commercial Motor Veh. Assn.
Mar. 9-15	Des Moines, Ia., Show, C. G. Van Vliet.
Mar. 14	San Francisco, Cal., Panama-Pacific Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
April	Calumet, Mich., Show, Coliseum.
May 29	Indianapolis, Ind., 500-Mile Race, Indianapolis Motor Speedway.
Sept. 20-25	San Francisco, Cal., International Engineering Congress.

The Week in the Industry

Motor Men in New Roles

REID Anderson Sales Manager—The Anderson Electric Car Co., Detroit, Mich., has appointed T. C. Reid to the position of manager of sales for Detroit and Wayne county. Mr. Reid has been with the Anderson company for the last 6 months, and during the previous 18 months was connected with other electric vehicle interests in this city.

Oley Now Manager—W. S. Oley has been appointed manager of the Maxwell-Metz Motor Co., Portland, Me., to succeed B. H. Gettis, who has returned to Detroit.

Sessions Sales Manager—The Porto Metal Garage & House Co., Thirty-seventh and Burnham streets, Milwaukee, Wis., has appointed R. N. Sessions as sales manager.

Rose in England—C. B. Rose, chief engineer of the Velie Motor Vehicle Co., Moline, Ill., is now at the Hotel Cecil, London, England, investigating the truck industry in army circles.

Pelletier Writing Reo Advertisements—E. LeRoy Pelletier will write the advertisements for the Reo Motor Car Co., Lansing, Mich. He will write no other gasoline automobile copy.

Benjamin Residing in Detroit—C. Arthur Benjamin, sales manager of the George W. Houck Co., Buffalo, N. Y., has become a resident of Detroit, Mich., where he will take care of the sales.

Jardine Returns from England—Robert Jardine, who has been in England and on the Continent for the past 6 months in the interests of the Rich Tool Co., London, S. W., has returned to the States.

Potter Leaves Oxford—M. H. Potter has resigned as chief engineer and factory manager of the Oxford Motor Cars & Foundries, Ltd., Montreal, Que. His plans for the future are undetermined, but he will no doubt remain in Canada.

Cartwright Heads Body Co.—The Commercial Automobile Body Co. has opened offices and sales rooms in St. Louis, Mo. Hugh Cartwright is president and general manager. He was for 17 years vice-president of the Banner Buggy Co. there.

Little Gets New Appointment—W. C. Little has been appointed representative for Michigan and Ohio by Brandenburg & Co., manufacturers' representatives of New York, Chicago and Detroit. Mr. Little's local headquarters are at 1311 Dime Savings Bank Building, Detroit, Mich.

Wittstein Knox Efficiency Engineer—H. L. Wittstein, who for the past year has held the position of supervisor of records for the Knox Motors Co., Springfield, Mass., has been appointed efficiency engineer of that company. Mr. Wittstein is a graduate of Sheffield Scientific School.

Bradfield Resigns—H. C. Bradfield, who has been connected with the Cole Motor Car Co., Indianapolis, Ind., for 4 years, in publicity work, has resigned. During the past 2 years he has been special traveling representative of the company in the West. A. S. Blakely succeeds Mr. Bradfield.

Garage and Dealers' Field

Howard Makes a Move—The F. S. Howard Motor Car Co. agent in Worcester, Mass., for the Mitchell and Chevrolet lines, has moved into new quarters at 746 Main street.

Milwaukee Company a Klaxon Dealer—The Western Motor Supply Co., 408-410 Jefferson street, Milwaukee, Wis., has been appointed Wisconsin distributor of Klaxon horns.

Ford's $100,000 Cotton Purchase—The Ford Motor Co., Detroit, Mich., has joined the bankers' pool recently organized in the South to help the cotton growers and has subscribed $100,000. This represents the purchase price of more than 3,300 bales of cotton.

Philadelphia Stevens-Duryea Moves—The F. Winsor Eveland Co., distributors of the Stevens-Duryea car, formerly located at Nos. 202-204 North Broad street, Philadelphia, Pa., has removed to Ridge avenue above Broad street. The company has taken over the business from the former agents, A. G. Spalding & Bros.

Twombly Taxi Service in Philadelphia—The Stoever-Hannold Co., Motor Mart, No. 605 North Broad street, Philadelphia, Pa., local representatives of the Twombly car, announce the early inauguration of a new Philadelphia taxi service, which is to use the company's underslung taxi. The maximum charge for use of the new taxi is to be 25 cents a mile, a considerable reduction in present rates.

New Marathon Tire Distributors—The appointment of additional territorial distributors has been made by the Marathon Tire & Rubber Co., Cuyahoga Falls, O. Within the past 2 or 3 weeks the following appointments have been made: Turner Electric Supply Co., Birmingham, Ala.; E. L. Taylor Co., Inc., Richmond, Va.; Frank Bros., Baltimore, Md.; Peerless Rubber Tire Co., Seattle, Wash., and the Denmead Auto Supply Co., Akron, O.

New Wilmington Bus Line—The Postles Auto Brokerage Co., of Wilmington, Del., has decided to inaugurate a daily automobile service from Wilmington to points in Kent and Sussex counties, chiefly for the handling of passengers, with a view to including freight if the demand is sufficient. A sixteen-passenger steamer will be first used, but later there may be five five-passenger cars instead, which would divide the territory.

Peerless Agency in Providence—Following the change in Boston whereby the business of the Peerless Motor Car Co., Providence, R. I., was turned from a factory branch to an agency, the business in Rhode Island has also been transformed. At Providence there was a subbranch identified with the Boston one, and now this has become an agency. J. W. Breese, who was manager, having bought out the business on his own account. He has moved the quarters from 37 Chestnut street to 27 Snow street, where he shares salesrooms with the J. C. Tucker Co., with service station in the rear.

Recent Incorporations in the Automobile Field

New York

NEW YORK—P. J. Durham Co.; capital, $10,000; motor cars. Incorporators: Percy J. Durham, 255 W. 55th street; Henry A. Maslin, 1122 Finlay avenue; Frederick C. Wulf, 707 Gates avenue, Brooklyn.

NEW YORK—Elite Taxicab Co.; capital, $10,000; Incorporators: Anna M. Dwyer and John F. Dwyer, both of 1080 Bryant avenue; Frank J. Dwyer, 418 West 14th street.

NEW YORK—Famous Packard Auto Renting Sorporation; capital, $5,000. Incorporators: Charles J. Clavin, 317 West 44th street; Theresa V. Moore and Joseph Clavin, both of 668 8th avenue.

NEW YORK—Goodyear Tire & Rubber Co.; capital, $1,000; to represent the Ohio corporation in Eastern United States and deal in its products. Incorporators: James W. Hobbs, 1972 Broadway; George Morris and Francis K. Raynor, both of 115 Broadway.

NEW YORK—Holt-Welles Co.; capital, $50,000; motor car supplies, etc. Incorporators: Calvert Holt and Edward H. Stickels, both of 1790 Broadway; Paul Welles, 463 West street.

NEW YORK—Monmouth Garage; capital, $10,000. Incorporators: Henry R. Wohlers, Franklin J. Griesbeck and John S. Johnston, all of 140 Broadway.

NEW YORK—Overland Service Station; capital, $1,000; general motor vehicle business. Incorporators: John Q. Bachman, 293 Webster avenue; George V. Harriman, 355 West 56th street; Edward F. Stoeckle, 354 West 56th street.

NEW YORK—Reliable Tire & Supply Co.; capital, $5,000. Incorporators: Bluma Sekoson and Estelle Sekosen, both of 934 East 179th street. Louis H. Lax, 429 West 30th street.

NEW YORK—Shears Selling Organization; capital, $20,000; motor cars. Incorporators: James E. Taylor, Theodore C. LeFevre and M. H. Briggs, all of 30 Church street.

NEW YORK—Spar East Co.; capital, $60,000; motor car supplies, etc. Incorporators: Alec H. Seymour, Roy E. Hallock and William H. Natter, all of 27 Pine street.

Ohio

AKRON—Akron Tire & Tube Co.; capital, $10,000; to manufacture tires, tubes, etc. Incorporators: L. L. Hunsicker, L. E. Hunsicker, W. C. Diemer, C. E. Smith and J. Diemer.

CELINA—National Mutual Automobile Insurance Association. Incorporators: L. M. Murlin and others.

CLEVELAND—Cleveland Electric Motor & Mfg. Co.; capital, $10,000; to manufacture electric motors, etc. Incorporators: W. K. Stanley, Samuel Horowitz, G. R. Brown, P. A. Prentice and J. R. Jewitt.

JEFFERSONVILLE—Jeffersonville Auto Co.; capital, $8,000; to deal in motor cars. Incorporators: W. W. Williams, F. E. Wilson, J. C. Creamer, G. E. Straley and M. F. Hudson.

SPENCER—Spencer Mfg. Co.; capital, $50,000; motor cars. Incorporators: C. R. Aldrich, J. J. Christy, J. H. Firestone, P. J. White and G. W. Hartman.

Oklahoma

OKLAHOMA CITY—Oklahoma Overland Motor Co.; capital, $20,000; to deal in motor cars. Incorporators: Sam Johnson, Edgar C. Johnson and J. Rooney, all of Oklahoma City.

Accessories for the Automobilist

OAKES Beartone Horn—A new horn has been brought out by the Oakes Co., Indianapolis, Ind., called the Beartone combination fan and horn. The horn, Fig. 1, is of the regulation diaphragm type and is mechanically operated. The diaphragm is fastened to the central portion of the cooling fan assembly and rotates with it. Inside of the fan support is placed a stationary piece which causes the diaphragm to vibrate when it is brought in contact with the latter. This stationary part is operated by a small lever shown at the back of the fan bracket. A button or small lever on the steering column is sufficient to operate the horn. The horn has several unique features. It cannot be operated by mischievous children when the car is standing if the motor is dead. The tone may be varied by the pressure of the button—strong on the country roads and low in the city.

Sly Tire Holder for Ford Cars—A tire holder, Fig. 2, combined with a lamp and license pad holder, and which is equipped with a lock has been announced by the New Era Spring & Specialty Co., Detroit, Mich., for Ford cars exclusively. The material is pressed steel. The license pad support is a cross piece at the top and the tail light support takes the form of an extension at one side. The attachment is simple and can be accomplished in a short time. No drilling is required as the device is held in place by clamps. The illustration shows rods running to the top holder, but this construction is not entirely necessary, as the concern supplies another means of attachment which fastens under the rear spring center bolt. For wire wheel carriers an offset cross piece is necessary to clear the wheel hub.

The price of the double holder for 30 by 3½ tires is $5, and for 31 by 4, $6, both being for rear attachment.

Beers Lantern—A lantern, Fig. 3, for use about the car has been brought out by the Beers Sales Co., Bridgeport, Conn. It uses a dry battery as its source of current and it is stated that it will give 50 hours of light on one cell, which costs approximately 25 cents. It sells for $2 with black rubber finish, $2.50 with polished brass and $3 with solid brass, nickel plated.

Van Sicklen Speed-Meter—Two speedometer models will be offered for 1915 by the Van Sicklen Co., Aurora, Ill. One of these is for cars in the Ford class and the other, Fig. 4, for larger cars. The former sells for $12 and the latter for $20. The Ford model is a bracket type and is adaptable to any machine with a 30-inch wheel. The larger model may be had in either flush or bracket designs and may be driven from the rear of the gearset or the front wheel, as desired.

No mechanical changes have been made in the Van Sicklen, which operates by air, but several changes have been made in the exterior. The size of the figures on the dials has been increased and a broad collar has been added to the larger instrument which allows it to be mounted flush. The season odometer registers 100,000 miles and the trip 100 miles.

The feature of the new Ford design is the driving gears. Crown type gears are used and these allow perfect meshing even when the wheel is out of true. It is said that they will not clog with mud and will not rattle or grind.

Where the front universal is exposed, drive is taken from this point, a specially designed and deeply grooved hobbed pulley locking positively to the member to which it is applied. The hobbing in the drive and driven pulleys is of the same pitch as the coil of the endless wire belt used and allows no slippage, it is said.

Hoover Shock Absorbers—To meet the demand for a shock absorber for cars up to 1,500 pounds, the W. H. Hoover Co., New Berlin, Ohio, has put on the market the device shown in Fig. 5. It is similar to the ordinary Hoover shock absorber except that it is smaller and instead of a buckle the straps are held by a small bolt. The price per pair is $5. The leather straps are guaranteed not to be affected by heat, cold or moisture and are said to be very durable.

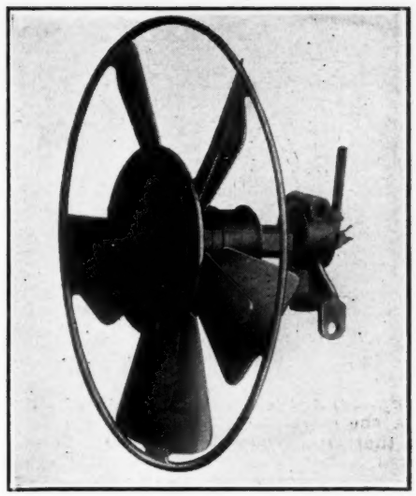


Fig. 1—Oakes Beartone fan horn

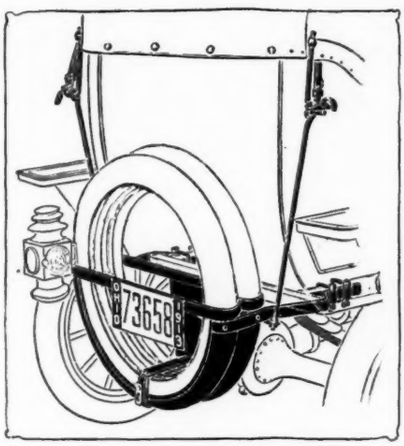


Fig. 2—Sly tire holder for Ford cars

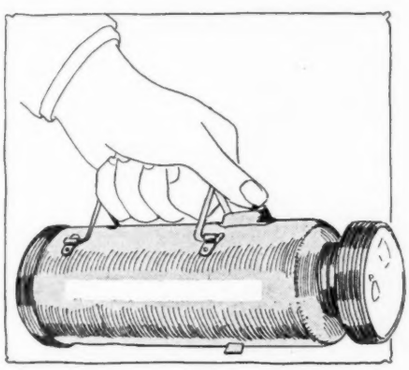


Fig. 3—Beers lantern which uses a dry cell

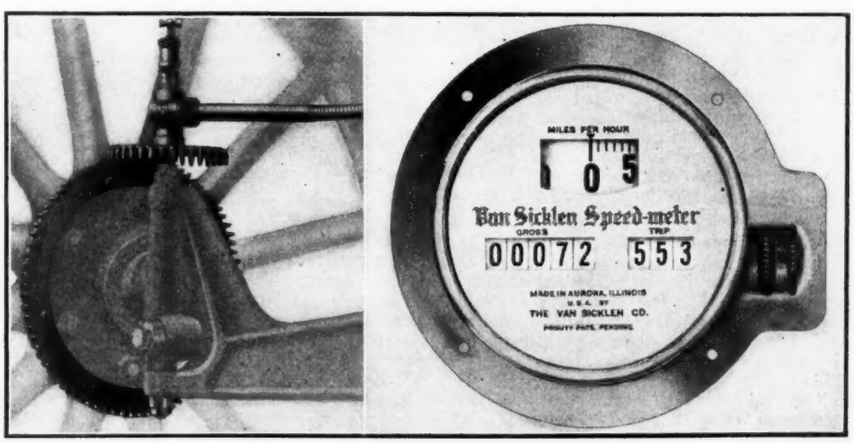


Fig. 4—Left—New Van Sicklen speedometer gear drive. Right—Flush type Van Sicklen speedometer

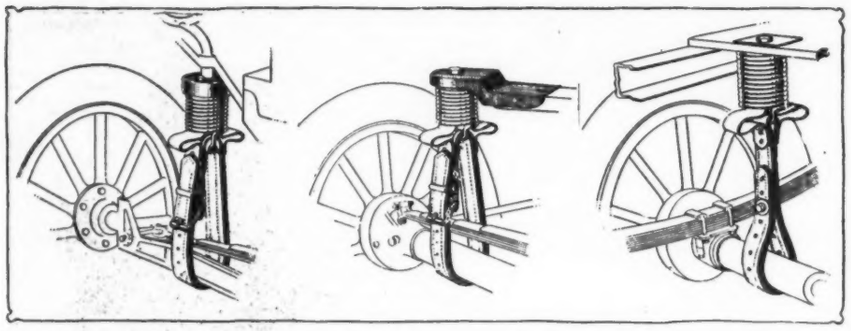


Fig. 5—Left—Hoover shock absorber for Ford cars showing special fittings to make attachment easy. Right—Shock absorber for cars up to 1,500 pounds

Special fittings are now furnished with the shock absorber made for Ford cars so that attachment is simplified. At the front the shock absorbers are attached to the lamp brackets and at the rear to the frame. These cost $7.

Sword Piston Ring Remover—A simple piston-ring remover which prevents breakage of the rings is being manufactured by the McKay-Lees Co., New Haven, Conn., and sold for $1. This tool, shown in Fig. 6, has two jaws at its end, these coming into engagement with the ends of the ring. Then by bringing the handles together the ring is spread so that it may be slipped over the piston.

Gray & Davis Ford Lamps Are Extra—In the description of the Gray & Davis starting and lighting system for Ford cars, appearing in THE AUTOMOBILE, November 5, pages 872 and 874, some readers gained the impression from the last paragraph that the electric head and tail lights were sold as a part of the complete equipment, which was not intended. The complete equipment, as stated, includes a dynamo, motor, 6-volt battery, wiring and the necessary connections. The lamps are extra.

Popp Co. to Market Welding Outfit—The M. L. Popp Auto Repair & Mfg. Co., 316 Thirteenth avenue, Milwaukee, Wis., has perfected a portable welding and cutting outfit of the oxy-acetylene type and is now arranging to market it. The outfit consists of a 40-gallon oxygen tank, a 3-gallon oxy-filter tank; an oxygen generator, gasoline furnace for heating the generator, and a Prest-O-Lite tank, the whole being mounted on a roller platform. The apparatus lists at from $45 to $125, depending upon size and capacity.

Vitalite Tires—Rubber tires which are guaranteed for 5,000 miles are made by the Vitalite Rubber Co., Woolworth Bldg., New York City. The particular feature which gives long life in this tire, it is claimed, is the vitalized rubber used in the tread. The tread stock is a compound from which nearly all the sulphur has been eliminated. This compound will vulcanize before the duck and friction are injured by the high heat.

Cutler-Hammer Dimming Switch—Fig. 7 shows a new headlight dimming switch with flush plate, developed by the Cutler-Hammer Mfg. Co., Milwaukee, Wis., and which supersedes this company's former combination of three gang switch used for series-parallel dimming control.

This new series-parallel switch is smaller and gives the two combinations as follows: Headlights bright and tail, and headlights dim and tail. Pulling out one button gives the dimmer combination, connecting the two headlights in series and tail light individually across the battery or generator terminals. Pulling out the second button connects the two headlights in parallel, the tail light remaining connected as before.

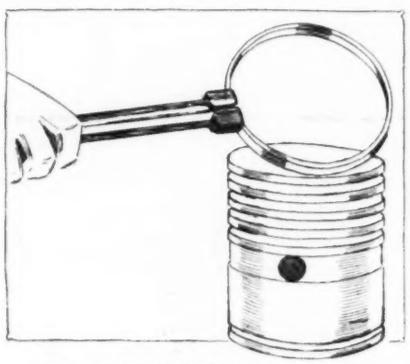


Fig. 5—Sword piston ring remover

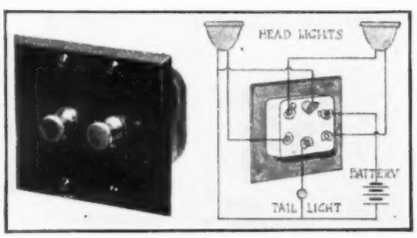


Fig. 7—Cutler-Hammer dimming switch

Fig. 8—Twitchell positive tire pressure gauge

This switch can be used on 6-volt circuits or on 12-volt, three-wire circuits using 6-volt lamps.

A quick-make and quick-break type mechanism is used and easily wired cupped washers are provided for making the terminal connections on the rear. The cupped washers prevent vibration from loosening the connections and where stranded wire is used all strands are held permanently in place. The switch mechanism is enclosed in a dustproof metal case and terminal connectors are mounted on a quarter-inch block of Pyroplax—a fireproof insulator.

Flush plates can be furnished in a number of finishes. The plate in the illustration is dull black which has proven a very popular finish. When the push-and-pull buttons are in the normal position, as shown, the switch is open. To close the circuits the buttons are pulled out. There is no danger of running down the battery by accidentally closing the circuit in the daytime when the lighted lamps would not be noticed. The position of the button, whether in or out, can be readily detected by the fingers alone when the switch is installed out of sight. Where desired this new series-parallel switch can be connected with other switches controlling side lights, speedometer and license lights.

Twitchell Tire Gauge—The new gauge, Fig. 8, made by the Twitchell Gauge Co., 1200 Michigan avenue, Chicago, Ill., has an indicator bar which automatically locks at any point of pressure, making inaccurate reading impossible. The gauge is very simple, consisting merely of a leather packed plunger attached to the indicator bar and moving in a small metal cylinder. The outward movement of the plunger is resisted by a coil spring. When this gauge is placed over the valve stem of the tire the piston is forced out and the rod indicates the correct pressure, the rod being held in this position by saw-tooth notches which catch in the edge of the casing. After the pressure has been read, the tooth of the indicating rod which is holding it in place is pushed out of engagement and the rod flies back. The gauge is guaranteed for 1 year and sells for $1. It is easily read because the figures are large and white on a black background. On account of its peculiar base the new valve may be held at any angle. In the dark it may be read by counting the notches.

Hoyt Pocket Multimeter—A new instrument, Fig. 9, comprising a voltmeter and ammeter in a single case, the face of the ammeter being on one side and that of the voltmeter on the other, has been announced by the Hoyt Electrical Instrument Works, Penacook, N. H. The whole device is only 2¼ inches in diameter and 1¼ inches thick, and it permits of both voltage and current measurements being made simultaneously but without the trouble of two instruments.

The instrument is of the moving coil type, jewel bearings being used. The prices vary from $10 for the 10-volt, 15-ampere type to $24 for the 40-volt, 40-ampere type. Practically all ranges and combinations may be had.

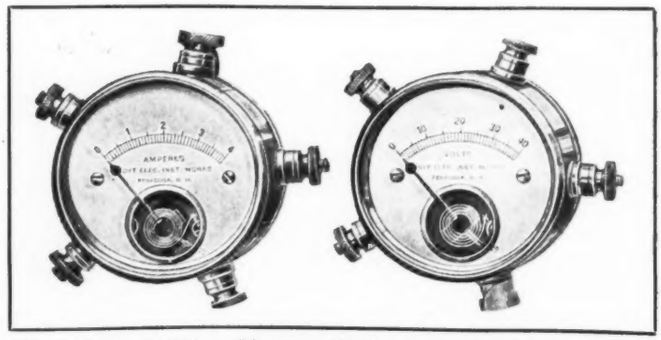


Fig. 9—Hoyt pocket multimeter, showing ammeter on one side and voltmeter on the other